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ARTICLE I.—*Observations on Expansibility as a Vital Property, and on the Influence of the Capillary Tissue over the Circulation of the Blood.* *By* HUGH L. HODGE, M.D., *Lecturer on the Principles of Surgery in the Philadelphia Medical Institute.*

INFLAMMATION has always engrossed the attention of pathologists. Its causes and nature have been the subjects of laborious investigation and of animated discussion. Former theories have however been generally abandoned, and in our day, the only important question much agitated regards the condition of the capillary tissue*; whether it be excited or depressed,—whether the capillary vessels be in a state of increased or diminished action during the inflammatory process.

Every one, acquainted with the science of medicine, must be aware of the importance of this question. All reasoning as to the

* In this essay I shall use the expressions *capillary tissue* and *capillary vessels* as synonymous—believing that no point here discussed is essentially involved in the present anatomical investigations as to the structure of this tissue, whether it consist of minute vessels frequently inosculating, or whether it be a kind of delicate net work or cellular structure, to which the arteries and veins perform the offices of vasa afferentia and vasa efferentia. This is the idea of professor BROUSSAIS, professor SCHULTZ, and others.

symptoms, causes, and treatment of inflammation, is involved in its decision. The views taken of the modus operandi of the causes and remedies of this disease, must be predicated on its nature; and hence the practical principles of those who differ on this subject must be, so far as such individuals act consistently, directly opposed.

With Mr Hunter, I believe that there is a morbid increased action of the capillaries in inflammation, in opposition to Vacca, Allen, Lubbock, Philip, Hastings and others, who maintain that there is a diminished action of the vessels, and that their enlargement is passive, owing to the *vis a tergo* derived from the heart and arteries. In every inquiry after truth on this subject, we should previously determine what is meant by the *action* of a capillary vessel; for on this point the whole discussion will turn. Dr Philip and his disciples employ this word as synonymous with contraction. Increased action of a vessel is with them increased contraction, followed, of course, by a diminution of size and expulsion of its contents. But Mr Hunter affixed a different meaning to this word; for he speaks of an increased action of the vessels, and yet affirms that in inflammation they "do not contract*." This language is not peculiar to Mr Hunter; for almost every medical writer uses the word action metaphorically, to express the state or function of a vessel, a tissue, or an organ. Hence we read of the action of the vessels in secreting bile, saliva, urine, &c.—of the action of the serous, or mucous tissue, of the iris, nipple, &c.—of the action of the stomach in digestion, of the brain in volition, &c.; not believing that there is in such cases any necessary contraction. The action, therefore, of a capillary vessel implies the manifestation of its vital properties,—increased action is the manifestation of such properties in an exalted degree.

The pathological question is thus reduced to a physiological inquiry as to the vital properties of capillaries; as to the modes in which their powers are displayed; and finally as to the consequences of the manifestations of their vital properties.

Upon many of these points there is no dispute. All physiologists agree, that capillaries have the vital property of contractility, that they contract on the application of certain stimuli, and that the result of

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* Hunter on the Blood, p. 251, American Edition.

this contraction is the expulsion of their contents. The object of this paper, however, is to show, that capillaries have a vital property of expansibility,—that they dilate under the influence of certain stimuli, and that the effect of their dilatation is to draw blood into their cavities from the supplying arteries, and thus materially to facilitate the motion of this fluid in the large as well as in the small vessels. The facts to be presented in support of this opinion, will render it at least probable, that expansibility is a property, not only of the capillary tissue intervening between arteries and veins, but of all capillary vessels,—of the radicles of the veins, lacteals, lymphatics, and ducts of glands, and that it is possessed in a slight degree by the heart and arteries, also as well as by the tissues confessedly erectile, as the penis, nipple, iris, &c.

While maintaining that certain tissues expand under the influence of stimuli, we are not obligated to demonstrate the mechanism of this operation, or even the tissue concerned. If the fact be proved, the lover of truth will receive it for the same reasons, and on the same grounds, as he believes in contractility, gravity, or electricity; and on reflection he will not find it more wonderful, that the particles of a living fibre should repel, than that they should attract each other. Contraction is as remarkable as expansion: *a priori* one could have been imagined as readily as the other. If we had been accustomed to regard expansibility as a vital property, this property would not appear more singular than that of contractility. Habit alone constitutes the difference in our minds. Who considers the repulsion between the north poles of two magnets, as more extraordinary than the attraction between a north and a south pole?—or who can explain the fact of attraction better than of repulsion? Both are equally incomprehensible*.

That expansibility is a vital property is not a new idea. Bordeu alludes continually to the erection of all glandular tissues as necessary for secretion, and to the erection of the absorbents as es-

* Were we disposed to wander from facts to hypothesis, the experiments of Wilson Philip, of Prevost and Dumas, of Dutrochet, and others, manifest sufficient analogy between the nervous power and galvanism or electricity, to form an hypothesis for the explanation of vital contraction and expansion, as readily as of physical attraction and repulsion. Vide some ingenious observations on the agency of repulsion in physics by professor Hare in his Chemical Compendium.

sential for their functions*. HUNTER speaks of a "power of dilatation,"—of "an action of dilatation," and has been followed in the use of such language by many authors. The French and other continental pathologists acknowledge its existence in what they term the erectile tissue.

The only author, however, who expressly acknowledges and treats of expansibility as a vital property is V. PRUS in an octavo volume, "De l'Irritation et de la Phlegmasie," Paris, 1825. By this power he explains the afflux of fluids to irritated parts, but does not attribute to the capillaries any active influence over the general circulation. That the motion of the blood in the large vessels is accelerated by a suction power in the capillaries, is an opinion promulgated by professor SMITH of Yale College, Connecticut, in the November and December numbers of the Philadelphia Monthly Journal for 1827; and by professor CHARLES SCHULTZ of the University of Berlin, in MECKEL's Archives of Anatomy and Physiology for 1826†, and has been taught by me more or less fully, since my first course of lectures in the Philadelphia Medical Institute in 1823.

The paper of the Berlin professor I first read after writing this essay, and find him using the following explicit language on this subject. "The course of the blood through the arteries does not depend only on the impulse received from the heart; the peripheral system [so he names the capillary tissue] has an *equal influence* in drawing the blood to itself."—Journal des Progrés, vol. vii. p. 68, 1828‡.

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* Vide Dict. Abrégé des Sci. Méd., tome vii. art. Erection, &c.—North American Medical and Surgical Journal, vol. i. p. 416.

† His opinions on the formation and motion of the blood are fully reviewed in the 5th, 6th, and 7th volumes of the Journal des Progrés, &c. Paris, 1827—8.

‡ Drs CARSON and BARRY have contended for the suction influence of the thorax over the blood in the veins, and have hence been severely criticised by Dr N. ARNOTT in his Elements of Physics. Although not advocates for the peculiar opinions of these physiologists, we believe neither they nor ourselves are affected by the criticism of Dr ARNOTT respecting the influence of suction over the motion of the blood. He says "such a doctrine could not be proposed or entertained for a moment by a person, understanding the principle of a common household pump; and that it has been published and tolerated by able men in the present time, will remain a proof to posterity of the deficiency, as regards fundamental science or natural philosophy, which now exists in the ordinary medical education."—p. 507. "The veins are pliant tubes free to collapse, and no pump can lift liquid through such." "A practical illustration of this proposition

The points to be discussed will all be embraced in the three following propositions, which I shall endeavour to sustain by facts and arguments.

I. The capillary and arterial tissues do not dilate passively from a vis a tergo, derived from the heart and arteries.

II. Some tissues possess expansibility as a vital property; that is, are capable of expanding under the influence of certain stimuli. This property is possessed most remarkably by the capillary system intervening between the arteries and veins, and by the radicles of veins, of the absorbents, whether lacteal or lymphatic, and of the excretory ducts of glands. That it also exists in the heart and arteries, perhaps also in the veins and the ducts of glands, as well as in those structures denominated erectile, as the iris, penis, nipple, &c.

III. The circulation of the blood in the arteries is powerfully aided by this dilating power of the capillaries, drawing the blood into their cavities; and this power of the capillaries is the almost exclusive agent in all increased local determinations of blood.

IV. During the activity of inflammation, an increased quantity of blood flows through the affected part.

PROPOSITION I.

The Capillary and Arterial Tissues do not dilate passively from a vis a tergo, derived from the heart and arteries.

The hypothesis maintained by Dr PHILIP is, that the vessels will enlarge when the vis a tergo is increased, or when the resistance of the vessels, in consequence of exhaustion or debility, is diminished.

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is afforded by putting the point of a syringe, capable of making a complete vacuum if desired, into a piece of gut, or eel skin, or vein, filled with water, and then trying to pump up the water. The result will be, that the fluid close to the mouth of the syringe will enter it, and the sides of the pliant tube will then collapse as a valve against the syringe making an end of the experiment."—p. 508. This must be granted; but our accurate mechanician has forgotten one essential circumstance as regards the living system; namely, the vis a tergo, the momentum which the blood already has in the veins, and which would prevent the valvular collapse of their parietes. This fact was noticed by Dr CARSON and ought not to have escaped Dr ARNOTT in his criticism. His illustration would have been more appropriate if two syringes had been employed, one at each extremity of a pliant and distended tube, so that the piston of one should descend while that of the other was slowly withdrawn. So far from a collapse, the velocity of the fluid would be increased by the suction power of the opposing syringe.

The dilatation is owing to a disproportion between the vis a tergo and the resistance of the vessels.

In support however of my first proposition, and in opposition to the opinion of Dr PHILIP, I present the following facts.

a. Contusions, when so severe as to paralyze the vessels without destroying their vitality, leave a part pale for a longer or shorter period according to the violence of the blow. BOYER in his Surgery (tome i. p. 105), notices several cases of local asphyxia from blows, "in which the heat, the sensibility, the movements, the pulsations of the arteries, in fine all the phenomena of life, after having been apparently annihilated for many days, gradually returned and resumed all their former vigour." He cites from DE LA MOTTE the case of a boy whose right hand was completely paralysed by a blow with a billiard stick, received on the outside of the forearm; "the hand for ten days appeared to be dead; but at the end of that time the heat gradually returned, the beating of the arteries became perceptible, and the hand was restored to its natural condition." How can the supposition of passive dilatation be consistent with these facts? The vis a tergo from the heart and arteries was perfect; other parts of the capillary system are dilated; but those vessels, whose powers are most exhausted, instead of being most dilated as they would be, if the theory were true, are the most constricted.

b. The same argument applies with equal force to all cases of local paralysis, whether from injury of the nerves of the part, of the spinal marrow, or of the brain. The vital strength of such parts is said to be weakened, and the vis a tergo from the heart is powerful; nevertheless, the large and small vessels diminish in size; they are not distended by an extrinsic force.

c. In every example of sedation, or diminution of excitement, the blood vessels of the part diminish, however active may be the general circulation. The mammæ lose their tension, and become soft and flabby in hysteritis; the feet become cold and bloodless in phrenitis; a wound of the scalp becomes pale, and the granulations and enlargement of the vessels disappear on the occurrence of severe arachnitis. In gangrene, the tension and swelling diminish before coagulation ensues, and before the vis a tergo has abated. Examples of this kind might be indefinitely multiplied.

d. Cold is very generally regarded as a sedative to the organic actions, even by those who maintain its stimulating influence on animal life. Parts subjected to its continued operation diminish in size; ligatures become loose, rings fall from the fingers, and paleness

ensues. The weakened parts do not distend so long as the cold is operative, and never until reaction is induced by exercise, heat, or some other stimulus*.

e. Parts which have been exhausted by continued irritation diminish in size; they are not distended by a vis a tergo as supposed by Dr PHILIP. A common example is observed at the orifice of an open bubo, and indeed of every chronic abscess. The edges are generally livid—the circulation continues but is very slow; the parts are incapable of adhesion or of granulating, and yet, no enlargement ensues from the influence of the vis a tergo on these exhausted parts.

f. When obstructions to the course of the blood exist, it has been supposed, that an enlargement and increased action of the vessels would result, giving rise to inflammation and fever. This idea has been the foundation of almost every theory of inflammation. Dr PHILIP at first adopted it in his work on Fevers (vol. ii. p. 23), but he, and most physiologists have abandoned the idea; for obstruction is universally succeeded by a diminution and not by an enlargement of the vessels, however strong the vis a tergo. Ligatures on arteries, pressure by bandages or tumours on these vessels, are followed by a diminution of size. So also when coagula form in the vessels, in aneurisms, mortification, &c. there is no dilatation; and when large congestions of blood occur in the venous vessels of the head, breast, or abdomen, the fulness of the arteries is lessened, and the pulse is small and weak.

The same is true of capillaries, as has been proved by the experiments of SPALLANZANI, BOYER, PHILIP, THOMSON, HASTINGS, (p. 50), GENDRIN†, and others, all of whom affirm that the blood retrogrades from the point of obstruction; the vessels diminishing in size, and yet exposed to the vis a tergo.

g. Arteries are often found in gangrenous abscesses, deprived of their exterior support by the sloughing of the cellular membrane and other soft parts, and yet maintaining their vital functions. In no such instance have they enlarged passively from the impetus of the blood.

h. Mr J. HUNTER exposed the femoral artery of a dog and dis-

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* Vide Larrey's Campaigns.

† Review of THOMSON on Inflammation, Journ. General. Aout 1827.

sected away its external cellular coat, on which the strength of the vessel is supposed to depend. No swelling was produced by the force of the circulation.

i. Mr JONES tied a ligature on the carotid artery, so firmly as to rupture the internal and middle coats, and to contuse severely the external tunic. The ligature was removed, and yet no dilatation ensued. Similar experiments were made by Mr DALRYMPLE, (TRAVERS's Essay, Medico-Chirurgical Trans. vol. iv. p. 442,) and by Mr HODGSON, (Diseases of the Arteries, p. 228,)—and with the same result as respects dilatation of the injured vessel. Hence a hernia of an artery is not regarded by modern surgeons as a possible occurrence.—(Vide North American Med. & Surg. Journ. vol. ii. p. 202.)

The above facts entitle me to the conclusion, that the vis a tergo, whatever may be its force and whatever impetus it may give to the blood, has not the effect of dilating the arterial or capillary tissue. To this conclusion, I know of but two apparent exceptions. The first is the formation and progress of true aneurisms; but all pathologists acknowledge the disorganized condition of the vessel in such cases. The second is the enlargement of the vessels during the systole of the left ventricle. This has been positively denied by PARRY, after the most careful and varied experiments, but has been maintained by many careful observers*, and cannot be entirely denied. The dilatation however is trifling, and being confined almost exclusively to the pulmonary artery and aorta, forms, at the utmost, but a slight, and I believe, the only apparent exception to our proposition. As regards the capillary tissue I know of no example of passive dilatation from the impetus of the blood derived from the heart and arteries.

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* The latest writer on this subject is professor SCHULTZ of Berlin, who affirms that "the dilatation of arteries, corresponding with the contraction of the heart, can be distinctly observed only in the great vessels, in the aorta and pulmonary artery; and this, not only in birds and the mammiferæ, but also in reptiles and fishes." "This dilatation of arterial trunks is only visible at a short distance from the heart; it disappears insensibly, its limit however is not well marked."—P. 69, Jour. des Progrés, &c., tome vii.

From the facts adduced under the second proposition, the question will arise whether this dilatation, trifling as it is, is simply the result of mechanical impulse.

PROPOSITION II.

Some Tissues possess Expansibility as a Vital Property; that is, are capable of expanding under the influence of certain stimuli.

The phenomena of expansion are so frequently observed in the nipple, penis, and other organs, and are in such cases so evidently independent of a vis a tergo, that the most distinguished modern physiologists have admitted, with BORDEU, an erectile tissue, and the consequent occurrence of vital erections. But as these active dilatations are occasionally observed in all parts of the body, and as they almost always involve either the absorption or expulsion of fluids, I am disposed to refer the expansile power to the *vascular* system, using this word in its most extensive sense*, without attempting however to demonstrate the tissue or tissues to which it belongs. My present object is to show that it exists,

1. In the *absorbents*, whether venous, lacteal, lymphatic, or glandular. Absorption is a vital process. It ceases with life. It is increased by appropriate stimuli, and diminished in cases of exhaustion or weakness. If contractility were the only vital property, absorption would be impossible under the influence of stimuli. The consequent contraction would exclude the stimulating fluid. In order that absorption may take place, the orifices of the vessels must be rendered patulous; that is, must dilate under the influence of appropriate stimuli. This is observed in all animated beings, so far as we can examine the phenomena occurring in such minute vessels as the radicles of the absorbents.

a. The seeds of vegetables, under favourable circumstances of

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* This opinion appears to be supported by the following facts:—vital erections are observed in all organized tissues;—in all active dilatations, vessels are enlarged and fluids attracted into their cavities;—the degree of erection is proportionate to the vascularity of the part and to the mechanical facilities for distention arising from structure, location, &c.;—and finally, the minute anatomical investigations of those tissues, termed erectile, show, that their essential structure consists of vessels greatly convoluted and frequently anastomosing,—presenting when divided a cellular structure. They appear to be types of the capillary tissue. "To explain its [the iris] singular movements, there is no necessity for admitting the existence of contractile muscular fibres; it is only necessary to notice the eminently *vascular and nervous* texture of the iris which gives to it (qui le fait jouir,) an active expansibility." M. JOURDAN, Dict. des Sciences Médicales.—PRUS, p. 39.

soil, moisture, heat, &c. swell, enlarge, and imbibe fluids. The dilatation of their organic pores necessarily precedes the entrance of the fluids, and of course, the formation of the new plant, the result of the irritation.

b. The same phenomena are observable in the roots of living plants, the seat of absorption. All their vessels are distended under the influence of stimuli, and hence filled with fluids, affording even to the unscientific observer, a striking contrast to the comparatively dry and constricted roots of a dead vegetable.

c. When plants are propagated by slips, or engrafting, the same turgescence of the absorbing vessels is manifested.

d. In animals, the mouths of the absorbents are so minute and the vessels so situated, that ocular investigation is usually impracticable. But visible absorbent orifices are presented to us in the puncta lachrymalia. Their operation is vital; for no artificial puncta have ever answered as a substitute, and when they become weakened by disease or old age, there ensues a stillicidium lachrymarum, however mechanically pervious they may remain, or however suitably located. When under the influence of their normal stimulus, the tears, they absorb this fluid from the tunica conjunctiva. This excitement is manifested, not by contraction, for then the tears would be excluded, but by expansion, evident to the eye and essential to their functions.

e. Certain stimuli increase absorption. Surgeons daily recommend frictions, irritating liniments, blisters, &c. for this purpose, and with acknowledged advantage in the discussion of fluids and tumours. If the influence of such remedies were to excite contraction, absorption would be diminished, not facilitated.

f. The lactiferous tubes of the female mammæ dilate under the influence of certain stimuli. Every one is aware of the readiness with which the milk flows during the pleasing irritation to which the nipple is subjected by the infant's mouth. That the discharge is not solely produced by suction, is proved, 1st, By the common operation of milking, in which the tubes emptied by pressure dilate,and hence absorb more fluid from the gland, under the influence of the irritation; 2d, By the fact that animals have some power over the excretion of milk, to such an extent at least, as not to yield it when they are irritated, or when they are mourning for their young; 3d, By the discharge caused by the application of irritants to the nipple

without any mechanical assistance*. In several instances I have witnessed an immediate flow of milk on touching the nipple with lunar caustic;—the tubes enlarging under the irritation, and giving exit to the liquid previously retained. The dilatation was immediate, and being essential to an important function, cannot reasonably be attributed to relaxation from prior stimulation.

The power thus visibly demonstrated in the absorbents of the tears and in the lactiferous ducts must, for the same reasons, be possessed by all other absorbents, and by all excretory ducts. They all have to take up fluids when appropriately stimulated, and must therefore dilate; for contraction alone would be inconsistent with their functions, and stimuli would render absorption more tedious instead of increasing its activity. In all these examples of dilatation, there is no vis a tergo operative, and hence the admission of the enlargement of absorbing vessels would be conclusive as to the active nature of such dilatations.

2. *Capillary blood vessels* possess Expansibility.

g. Certain stimuli or irritants† are immediately followed by an enlargement of the capillaries; there is no evidence of prior contraction and subsequent exhaustion.

Caloric is a universal stimulus. When a portion of the cutaneous tissue is immersed in warm air or warm water, an immediate distention of the capillary vessels is observed. This dilatation by the stimulus of heat is as immediate as the contraction of a muscular fibre from any mechanical irritant; the one is as direct an effect as the other. There is no evidence of exhaustion or debility of the capillary vessels; for all the phenomena peculiar to life are augmented, such as heat, scarlet redness, circulation, and secretion. Neither should the effect be attributed to an increase of the vis a tergo; for, 1st, The enlargement of the capillaries occurs before the excitement of the supplying arteries; 2d, It is often great when there is no evidence of increased action of the larger vessels; and 3d, Such dilatations may often be excited by caloric, when the actions of the heart and arteries, including the supplying arteries, are exceedingly depressed. In all cases of prostration, where the pulsations of the

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* Prus, Op. cit. p. 38.

† When not too intense or acrid, for in such cases vital power is overwhelmed. A glass of brandy stimulates; a pint of alcohol kills instantaneously. Warm water at 98° of Fahr. increases vital action; iron at a red heat destroys the part to which it is applied.

heart and arteries can scarcely be perceived, where the surface is cold and pale, and all the organic vital phenomena are greatly diminished, warm applications are always resorted to; and when they redden the skin and produce inflammation or vesication they are advantageous. Where in such cases is the vis a tergo to dilate the capillaries? or what reason is there for imagining that the effect of the stimulus on these pale, bloodless, and weakened vessels, is to contract them, and thus to exhaust their power that they might yield to a vis a tergo? Further exhaustion would be death, which caloric, as every practitioner knows, would rather prevent than accelerate.

These remarks respecting caloric may be extended to most other irritants. The puncture of a needle, or the sting of a wasp, is immediately followed by redness; a mote under the eyelids instantaneously causes an enlargement of the vessels of the conjunctiva; a drop of nitric acid reddens the skin, and so of other irritants. In none of these cases is there evidence of contraction preceding dilatation; or of exhaustion directly or indirectly produced*.

h. Internal stimuli often enlarge the capillaries without any evidence of an increased vis a tergo. How instantaneous is the appearance of a blush, mantling the face and neck from the operation of certain passions. The enlargement of the small vessels in blushing is the result of a nervous irritation, not of increased action of the heart; for 1st, This viscus is often undisturbed: 2d, In all instances the blush is partial; if owing to the contraction of the heart it would be universal: 3d, In violent palpitations and other increased actions of the heart, the capillaries are not distended as in blushing, but are often remarkably contracted. Their enlargement, as well as their contraction, must depend on inherent powers.

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* There can, I think, be no more decided proof of the inaccuracy of microscopical experiments on the blood vessels of living animals, or of their inadequacy to support the pathological doctrines erected on them as their sole foundation, than the assertion of Mr HASTINGS, as deduced from experiments (p. 55, HASTINGS on Bronchitis, London, 1820), that the direct effects of heat and cold are the same; both producing primarily active contraction, and secondarily, debility, allowing of passive dilatation from a vis a tergo. If however Mr HASTINGS would place one hand on a mass of ice, and the other near a fire, the opposing influences of heat and cold would be visibly demonstrated. Vide a critical examination of the experiments and opinions of Drs PHILIP and HASTINGS in the introductory volume to the posthumous works of Dr CALEB H. PARRY, by his son CHARLES H. PARRY, London, 1825.

i. The remedial agents, which increase the diameters, as well as the functions of capillaries, without augmenting the action of the heart and arteries, in other words, the vis a tergo, are very numerous. To this head must be referred most of the diaphoretics, diuretics, expectorants, and cathartics. Mercury also will often produce local dilatations, secretions, and even inflammations of the skin, gums, tongue, and salivary glands, without any evident excitement of the general circulation. In such cases, is not the hypothesis unfounded which maintains that the vessels, thus acted on by internal stimuli, and having all their vital phenomena increased, must be debilitated before they enlarge?

Even the dilatations of capillaries from the diffusible stimuli, wine, brandy, &c. which do disturb the heart and arteries, cannot be owing to a mere mechanical impulse; for, as already hinted, the enlargement is often in an inverse ratio to the vis a tergo. Thus, when the action of the heart is violent, the capillaries are often undistended; and their distention is often very great when the cardiac pulsations are languid.

k. Again: Whenever any excitement is manifested in the functions of a tissue, organ, or apparatus; or when any new or increased demand is made on such tissues or organs, the capillary vessels dilate to meet the emergency.

Compare the different conditions of the capillary system in childhood and old age. In the former all is activity, not only to replenish the various secretions and excretions so abundant in infancy, but especially to furnish the materials for growth. The capillary system is full and tense. In old age, the phenomena of life are diminished, nutrition and secretion are lessened; while wrinkles and emaciation are substituted for the fulness and tension of a prior stage of existence. The same difference is observed in the peripheral system of infants when in health and when diseased; and of the extremities before and after the occurrence of paralysis. Where the phenomena of life are most displayed, the capillaries are most developed; where they are diminished, these vital tubes are proportionally smaller. Surely in the former case, they are not debilitated and passively dilated.

The same remarks are applicable to all *general* excitements of the capillary system. Are not the vital energies in greater exercise, and the capillaries at the same time more dilated in an inflammatory fever than in a typhous fever, or in hectic wastings; during the ruddy

excitement of health than during syncope; in the hot than in the cold stage of fever; during the stage of reaction than in that of collapse from concussion of the brain; when under the influence of heat than of cold; while the individual is burning with anger than when torpid with fear? That the capillaries in these and similar cases are not distended by an increased energy of the heart was proved in our first proposition.

The same enlargement of the capillaries is observed in all cases of *local* excitement: cases in which no one contends that there is a diminution of any of the vital phenomena. The capillary vessels are enlarged in the growth of tumours; in tissues or glands for their increased secretion, whether temporary or continued; in the heads of animals which are renewing their horns; in the organs of generation of those female animals which are in season; in the brain and face, during excitement from moral or physical causes; in the uterus after conception, and even before the descent of the ovum; in the iris, nipple, and penis when appropriately excited. In none of these cases is there any evidence of exhaustion of power or an increased vis a tergo. In all, the manifestations of vital energy are increased.

l. The active enlargement of capillaries is evinced when the main artery of a limb has been tied. The immediate effect is the cessation of the circulation below the ligature, and the consequent coldness and paleness of the limb; but in a few hours the circulation usually returns, and the thermometrical temperature of the affected limb and the activity of the capillary circulation are greater than those of the sound limb. This excitement after some time gradually diminishes to the ordinary standard of health. The increased activity of the capillaries has been referred to the vis a tergo, operating through the anastomosing vessels; but this explanation is not satisfactory for several reasons. 1st, The influence of the heart's contraction, when the blood passes through small anastomosing vessels and by circuitous courses, must be less powerful than when the main channels remained pervious. The vis a tergo is therefore lessened, and yet the capillary distention is greater than it was before the operation, or than in the sound limb. 2d, This argument is of more force, when it is considered that the enlargement commences in the smaller, and gradually extends to the larger arteries; and also that in some cases the branches from the main artery, through which most of the blood must pass, do not become percep-

tibly enlarged. For these anatomical facts, we have the best authority. Mr Hodgson, on Diseases of Arteries, p. 247, says "the dilatation takes place principally in minute ramifications; the trunks and the mouths of the vessels going off above the place of obstruction in the main artery, in several preparations, did not appear to be larger than in their natural state, and in a few instances only, a slight dilatation was perceptible."—Again: "the dilatation of the minute arteries does not appear to be owing to the vis a tergo when the main artery is tied. After amputation, the main artery and its branches are not enlarged; I have invariably found them remarkably contracted." Professor Schultz observes (Journal des Progrés, &c. vol. vii. p. 62), "this dilatation [of the anastomosing vessels] does not occur immediately after the operation: it is slowly effected. M. De Walther has even affirmed that he could not discover any dilatation of the collateral vessels after the death of a man who had suffered from an aneurism at the bend of the arm." From these facts, it is evident that the vessels, which are the least under the influence of the heart, are the most dilated. 3d, That the dilatation is not owing to the vis a tergo is also proved by the eventual return of the capillary, and of the more minute, arteries to their ordinary size, at the time when the larger branches being dilated, the vis a tergo becomes more operative.

Let these facts be taken in conjunction with those in support of proposition first, and it can hardly be affirmed that the increased size of the capillaries after obstructions of the main artery, is owing to a vis a tergo. I believe that in such cases, the stimulus of arterial blood being withdrawn on the application of the ligature, a temporary suspension of action ensues. This is followed by reaction, agreeably to a law of the animal system and as observed under various other circumstances, as when the hot succeeds the cold stage in fevers; during which excitement the capillaries dilate and draw the blood freely into their cavities, as will be fully illustrated under our third proposition.

The facts hitherto adduced are chiefly *physiological*, demonstrating, I think, that expansibility is an inherent property of the sanguine capillary tissue. *Pathological* facts bear with equal force on the same point, and may be confidently urged, especially upon those who regard physiology as the true basis of pathology. Let it be remembered that the question to be determined is, whether the enlargement of the capillaries is active or passive;—produced by an inherent dilating power, or by a vis a tergo.

m. During the acute stages of inflammation, the parts are very tense and hard; and moreover, when such parts are covered by any unyielding membrane, as hardened cuticle, fascia, periosteum, &c., the phenomena of inflammation are greatly enhanced, and the progress of the disease to suppuration or gangrene is hastened, while the fascia or membrane becomes very tense. Whence the distending power in such cases? Is it intrinsic or extrinsic?—Not extrinsic, because 1st, The distention is not proportioned to the excitement of the heart and arteries; being often great when this excitement is at the healthy standard, and sometimes even when the general circulation is greatly depressed. 2d, If the swelling and tension were owing to a vis a tergo, the resistance of the membranes, so far from aggravating, ought to cure the inflammation by restoring the equilibrium between the resistance of the small vessels and the vis a tergo. The passive distention of the former would be effectually resisted and the balance restored, which, according to the seductive simplicity of the *mechanical hypothesis* of Dr Philip, is the only desideratum in the treatment of inflammation. Hence Dr Lucas, one of his disciples, recommends pressure as one of the most powerful remedies for this disease; but every practical man knows the mischief produced by pressure from bandages, ligatures, tendinous sheaths, fasciæ, &c. during the acute stages of the phlegmasiæ; for 3d, We find that the removal of pressure moderates the symptoms, shortens the disease, and facilitates resolution. Hence one advantage derived from fomentations and poultices in superficial inflammations in softening the indurated cuticle; hence the necessity for dividing in a transverse direction the tendinous sheath in paronychia and the fibres of fasciæ during sub-aponeurotic inflammations. Relief could not be afforded by such measures, if the dilatation were passive; for the vis a tergo being increased and the capillaries being debilitated, the distention would continue augmenting until rupture or mortification should ensue.

This objection alone, I regard as sufficient to overthrow the whole hypothesis of our opponents. When inflammation disappears, they say the balance is restored between the capillaries and the supplying vessels,—the disproportion between the resistance and the vis a tergo having ceased; but how can this ever occur spontaneously, that is, without the interference of the surgeon. The more the palsied capillaries are distended, the more incapable are they rendered of resisting the impetus from the supplying vessels.

How then is the supposed necessary balance restored? How can the capillaries recover sufficient energy to resist an impetus, which on their supposition is continually increasing? Rupture or gangrene we should imagine must be the result of every inflammation, in which art does not interfere with its pressure or its astringents.

n. The distending power not being therefore extrinsic, depending on a vis a tergo, is *intrinsic*, and its exercise is the result of irritation. For experience shows that when the irritation is removed, the tension disappears: the same capillaries exposed to the same increased vis a tergo, will often diminish in size on the removal of the cause. Remove a mote from the conjunctiva, or a splinter from the skin, and the enlarged vessels are lessened, and the inflammation is resolved, notwithstanding the excited condition of the supplying vessels. On the contrary, the increase of irritation is necessarily followed by a more violent inflammation; its phenomena becoming more intense in proportion to the severity of the irritant, until the vital powers of the part become exhausted and gangrene ensues. Irritation, therefore, and not the vis a tergo, is the cause of the tension of inflamed parts. This irritation is generally increased by pressure, which hence aggravates the phenomena and accelerates the progress of inflammatory affections.

o. Inflammation can be excited by sinapisms and blisters in patients whose vital powers and actions are nearly exhausted, when the pulse is not to be felt, and the surface is cold. The irritation is applied to capillaries greatly debilitated, and no practitioner acts on the supposition that such stimuli would still further weaken them; for then gangrene would ensue. Neither can there be, in such cases, any increased vis a tergo; yet they become enlarged—certainly by an inherent power excited by the irritants. So also the occurrence of "critical inflammations and abscesses" in prostrated states of the system, where the action of the heart and arteries is barely sufficient for the maintenance of life, is inconsistent with the idea of a vis a tergo as the cause of the dilatation.

p. The veins of an inflamed part and those proceeding from it are distended*. Whence this enlargement? Dr PHILIP and his sup-

* "This was evident in the following case: I applied caustic to the ball of the great toe of a patient every other day; and after each application the surrounding part put on a blush, and all the veins on top of the foot as well as up the leg, immediately began to swell and became large and full. This was so remark-

porters maintain that the blood is congested in the capillaries; that owing to the debility of these vessels, it is nearly or altogether stagnant. These tubes, therefore, cannot empty their own cavities; how then can they fill and distend the veins proceeding from them? If, however, the capillaries manifest, during inflammation, an increase of their physiological power, if they dilate actively, the blood will not only be determined to these vessels in larger quantities, but will traverse them more readily, and distend the veins from the impetus acquired from the heart and arteries, assisted in all probability by a contraction of the capillaries alternating with their dilatation. These points will be noticed under our third and fourth propositions.

q. The condition of the capillary vessels in acute dropsies and active hemorrhages, (states very analogous to inflammation, if not, as maintained by many, identically the same) also manifests the connection between vascular irritation and increased diameter. Such effusions of serum and blood often depend on local irritations without any increased vis a tergo, and sometimes even when such force is evidently diminished. The vessels instead of contracting, dilate under the irritation, allowing and facilitating the exit of the fluids; and it is only when the irritation is removed that the discharge is arrested.

r. Nævi materni, and aneurisms from anastomosis afford very beautiful illustrations of the active independent power of the capillaries to enlarge their diameters.

3d. The *Arteries* also enjoy an expansile power. This is less evident than in the capillaries, but may nevertheless be demonstrated by attention to their varying physiological and pathological condition. That arteries do vary in their diameter, no one will deny, and in Proposition I., I endeavoured to prove that their enlargement did not result from the contraction of the heart. The vis a tergo is not sufficient to distend these tubes when paralysed, contused, or otherwise debilitated, much less when in the entire possession of their vital powers.

The physiological facts in proof of the active dilating power of arteries are very numerous. I can only allude to them under a few general heads.

s. The continued operation of local stimuli, causing first dilatation of the capillaries, speedily excites a sympathetic enlargement of

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able that the patient watched for this effect on the days on which the caustic was applied."—HUNTER on the Blood, &c., p. 137, Am. Ed.

the supplying arteries. Place a hand or foot in water at 100 deg. Fahr.; the distention of the capillaries will soon be followed by an increased fulness of the radial and ulnar, or of the tibial arteries. So also the supplying vessels dilate during the renewal of the stag's horns, the erection of the penis, the enlargement of the uterus in gestation, the distention of the mammæ in lactation, &c. &c. (Proposition II. *k*.) The pulse in such instances is not only fuller, but more tense and vigorous. This fulness and tension cannot be owing to the heart, for its actions are undisturbed; and the pulse in every other unexcited part is soft and of its natural volume.

t. So also we have a fulness of the pulse and an enlargement of the arterial system in all healthy excitations of the body, as from exercise, from the influence of hot air and hot bathing, from the exhibition of wine, brandy, and other diffusible stimuli, and from the operation of anger and other exciting passions. It can hardly be imagined that any modern physiologist should adhere so tenaciously to the mechanical philosophy of ages long since past, as to attribute such distentions of the arterial system to the forcible contraction of the heart. Neither will any one suppose that the arteries are debilitated when all their vital functions are augmented.

It would be extending this essay to an unreasonable length, to dwell on more detailed examples of the same normal enlargement of the arteries. I shall therefore merely adduce a few pathological facts confirmatory of the same views.

u. The arteries going to an inflamed part are enlarged. Dr Philip denies their enlargement; but Mr Hastings, his best advocate, does not question their increase of diameter. In cases of severe inflammation of any organ or tissue, the size of the supplying arteries will be found augmented. Hence the fulness of the carotids in phrenitis and tonsillitis, of the radial and ulnar arteries in rheumatic affections of the hand, &c. Whence their distention? For reasons already advanced (section *s*), not from an increased vis a tergo; neither is it from exhaustion or debility, for Dr Philip himself acknowledges their increased action. This fact indeed forms the very foundation of his theory; for debility of the capillaries with increased action of the supplying vessels constitutes his doctrine of inflammation. The power of distention belongs, therefore, to the arteries themselves. The irritation commencing in the capillaries is sympathetically propagated to the larger vessels, which idea is con-

firmed by the fact, noticed by Dr JAMES and others, that if any of the supplying vessels be divided, others will enlarge.

v. This sanguine irritation often excites sympathetically an inflammatory fever. This state is characterized by an "increased action of the heart and arteries." The pulse of most, if not of all, tangible arteries, is full as well as tense, and a general turgescence of the arterial and capillary systems would seem to exist. Debility of the arteries is not here contended for, and the increased action of the heart is surely not adequate for the universal distention of the arterial and peripheral system of vessels.—Vide Proposition I.

w. A similar enlargement of the arteries is occasionally observed in acute hemorrhages, evidently depending upon the same causes.

x. When the main artery of a limb is tied, we have already noticed the fact (section *l*), that not only the capillaries but also the arteries are enlarged, without any debility of the vessel, and under a diminished vis a tergo.

y. In aneurismal varix, and in varicose aneurism at the bend of the arm, where part of the blood is immediately returned by the injured vein, and of course lost as respects the capillary vessels, the brachial artery is found enlarged. There is no increased vis a tergo, and there is no debility of the vessel. Its enlargement, therefore, must be active, that is, dependent on its own vital properties,—the irritation arising indirectly from the want of blood in the lower part of the limb. The permanent enlargement, says Mr HODGSON*, seems to depend on *that property in the vascular system*, whereby the size of the vessel is always accommodated to that of the part which it supplies (that is to the want of blood in any part); hence the vessels enlarge in diseases of the joints, in tumours, &c., as well as after an artery is obstructed†. Mr HODGSON as well as Mr HUNTER frequently acknowledge, in this indirect manner, the dilating power of arteries and capillaries, without expressly attributing to them expansibility.

z. Numerous experiments upon blood vessels made by distinguished physiologists, with other objects in view, prove the ex-

* Diseases of Arteries, p. 254.

† A respected friend has objected, that this and other analogous cases are examples of growth; the enlarged size of the vessels arising from the deposition of new organic particles. I answer, that, in most cases, the enlargement is immediate, and that in all, dilatation must precede growth.

pansile power of arteries. I shall quote facts from two authors only, each of whom maintains opinions opposed to those which I am advocating. Mr CALEB H. PARRY*, in his 23d experiment, after having exposed and carefully measured both carotid arteries, tied one vessel: the other increased in size. When this was also tied, it resumed its original dimensions; proving that the previous distention was not owing to a vis a tergo. To this conclusion, PARRY himself was led; for he maintains as the result of numerous experiments, that the arteries are always during health distended beyond the size to which their elasticity would bring them (p. 69); and moreover, that this forced distention of an artery does not depend on the impulse of the blood from the left ventricle, (p. 71). This distention, he observes, is increased in local determinations of blood; and as it does not depend on the elasticity of the arteries, nor on the systole of the heart, "we are compelled to admit as the cause of the common dilatation of the larger arteries, and still more forcibly of that which is preternatural, the mechanical distending power of the blood which they contain."—p. 78. This explanation, however, is unsupported by facts; and it would be difficult to conceive how the blood, when in rapid motion through the arteries, could mechanically dilate one vessel and no other, unless some change previously occurred in the parietes of the tube.

The second author to whom I refer for facts, is Mr HASTINGS†, who, after many and diversified trials, asserts that mechanical and chemical irritants applied to the larger arteries will often excite contractions and dilatations of the vessels in the part irritated. "This increase of motion did not arise from any modification of the heart's action; for the degree of dilatation and contraction in the unirritated part of the vessel nearer the heart was unaltered"—p. 26. Neither is the dilatation owing, as Mr HASTINGS would seem to intimate at page 31, to a diminution of irritability or to a suspension of power, for contraction would then be suspended instead of being augmented; nor to relaxation after prior contraction, for such alternate relaxations and contractions do not occur in muscular fibres (those of the heart alone excepted, to which we shall presently allude) when mechanically or chemically irritated. A tonic contraction exists, so

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* PARRY on the Pulse, Ed. 1816.

† On Bronchitis, London, 1820, p. 24, et seq.

long as the irritant is operative. The increased pulsation of arteries under the direct influence of stimuli, is, therefore, but a more clear manifestation of their normal actions ;—dilatation being the result of stimulation as evidently as contraction. This is a very fruitful subject. It embraces all questions relative to the causes, nature, and varieties of the pulse, and admits of numerous illustrations. But the facts already adduced, taken in conjunction with the well known varying condition of the pulse in cases of sedation or diminished excitement of parts, as well as in those of irritation, prove that its condition, as to size, tension, and strength, does not depend solely on the systole of the left ventricle, but, at least to an equal extent, on the degree of excitement in the arteries; and that the actions of the arteries are greatly influenced sympathetically by the ever-varying conditions of the capillary tissue to which they are distributed. The formation of the pulse depends on the heart; but its size and tension, on the degree of excitement existing in the arteries and capillaries, so long as there is a free supply of blood.

4th. Expansibility is exhibited by the *Heart*. The enlargement of the cavities of this organ after contraction has something so peculiar, that many physiologists have attributed it to an inherent power and not to a vis a tergo. From the Dict. des Sci. Médicales Abrégé, we learn that this opinion has been advanced by Hamberger, Perrault, Senac, Bichat, and Dumas. Dr Philip, whose opinions we have hitherto been opposing, advocated this idea in his Inquiry, and since in the 12th volume of the Medico-Chirurgical Transactions; and it has been received with certain modifications by Mayo, Blumenbach, Brodie, Carson, Bostock, Prus, and others. Some of these authors refer the dilatation to a *vital* relaxation; some to a peculiar set of contractile fibres; others, as Bostock, to elasticity; others to the relaxation of spiral muscular fibres; Dr Carson to the dilating power of the lungs and thorax; and a few to an active inherent power, without locating it in any individual tissue of the heart. The first question, and the only one which at present concerns our subject, regards the actual existence of expansibility. This seems to be proved by the following facts.

aa. The heart of a living animal, when removed from the body, will continue to pulsate for some time. If the heart of a frog, just extracted, be thrown into warm water, a violent action, according to Dr Carson, will be excited, and in some instances a small

stream of a bloody colour will be projected through the transparent fluid. Dr PHILIP records the same fact.

bb. If the heart *in situ* be grasped with the hands, great resistance will be felt during its diastole. PÆCHLIN says a very powerful pressure cannot completely restrain this dilating power*.

cc. This dilatation continues, says PRUS, after the veins have been tied; of course, therefore, in opposition to atmospheric pressure, as the entrance of blood is thus prevented.

dd. Mr HUNTER (p. 125, Op. cit.) says that the heart dilates and contracts more fully from exercise and other natural excitants. The same stimulus which increases its contractions, augments its dilatations. This is a phenomenon not observable in the muscles of the trunk and limbs; of the stomach, bowels, bladder, &c., and one which the experiments of HASTINGS indicate as belonging also to the arterial system (section *z*); thus characterizing the circulatory apparatus and apparently essential for the motion of fluids.

The heart would hence appear to possess an active dilating power, exercising a slight suction influence over the blood in the large veins near this organ, and thus facilitating, instead of opposing, the ingress of the blood. Evidence, I think, is yet wanting to prove, that any part of the circulatory apparatus, during its healthy condition, resists the motion of the blood. Each portion co-operates, and beautifully harmonizes with every other portion, in carrying the vital fluid through the circulation,—an idea to be further illustrated in the ensuing proposition.

PROPOSITION III.

The circulation of the blood in the arteries is powerfully aided by this dilating power of the capillaries, drawing the blood into their cavities; and this power of the capillaries is the almost exclusive agent in all increased local determinations of blood.

"Ubi irritatio, ibi affluxus."

If the two previous propositions have been substantiated by the facts adduced, the present would result as an inevitable corollary. If the capillaries actively dilate, any fluid in the supplying arteries will necessarily be drawn into their cavities, on the same principle

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* PRUS, p. 51.

that a fluid enters a pump or syringe on the ascent of the piston; for, as already observed (p. 4, *note*), collapse of the sides of the pliant arterial tubes is prevented by the vis a tergo.

The suction power of the capillary tissue, which can thus be maintained by *a priori* reasoning, may, I think, be positively demonstrated by numerous facts,—proving not only its existence, but its great and essential influence over the motion of the blood; for although the suction exercised by any single vessel is exceedingly slight, yet the combined influence of the whole capillary tissue, forming the substance of every portion of the body, must be very effective, and "at least equal to the impetus received from the heart." Should also any portion of the peripheral system be excited, such excitement, causing increased dilatation, will simultaneously produce an increased afflux of blood to the irritated part. In adducing facts in support of this proposition, some repetitions will be unavoidable; but further evidence will be exhibited, while examining the circulation in all living beings, of the existence and importance of an active dilating power.

1st. *In Vegetables.*—The fluids absorbed by the roots are conveyed, under the name of sap, through tubes in the alburnum, to the branches, twigs, leaves, &c., and, after having suffered some change, analogous to that from respiration in animals, are returned by other vessels for the nutriment of the plant. The motion of the sap depends on vital powers; for it occurs only during the life of the plant, and in those parts only which retain their vitality. That expansibility, as well as contractility, is essential to the motion of these fluids, is shown by the following facts.

a. The sap ascends when the trunk and branches are subjected to the influence of a warm atmosphere; but it remains in the root when such stimulus is not applied. It is manifest, that the caloric, in such cases, operates on the superior or exposed portions of the plant; the roots, buried in the soil, being comparatively unaffected by atmospheric variations of temperature. Examination proves, that parts thus stimulated swell, and, from a comparatively dry state, become moist and succulent; in other words, that the vessels dilate under irritation, attract or suck in the nutritious fluids, whence result leaves, buds, blossoms, and fruit. There is no vis a tergo to distend the whole peripheral system of vessels, and in such textures, dilatation must precede the entrance of fluids.

b. This phenomenon and this explanation are more evident in the

following fact. A vine, running on the wall of a smith's shop, shoots some of its branches through a crevice into the interior of the building. In winter the exposed portions became torpid and apparently dead; the ramifications, however, at the superior portion of the plant, which were warmed by the furnace of the smith, vegetate and blossom*. Its vessels, stimulated by caloric, attract from the distant root and through a torpid trunk, its nutritious juices.

c. HALES has shown, that if a branch be cut from a vine, and its cut extremity be immersed in a fluid, absorption ensues. In this case the ligneous tubes, not capable of any immediate alterations of their calibre, cannot be the active agents of absorption; the attractive power is located in the smaller vessels, and by its exercise, fluids are drawn into their cavities. Every one knows how long the beauty and vigour of leaves and flowers may be preserved by immersing their stalks in water.

d. An analogous fact is evinced in the propagation of plants by slips. Here nutritious fluids are absorbed from the soil by vessels which previously attracted their fluids from the roots of the parent plant. The success of the common operation of engrafting is to be attributed to the same suction power in the extreme vessels.

e. The course of the sap in plants is often altered by local irritations, so that the descending sap ascends, or the ascending descends. Thus M. DUTROCHET† affirms, from numerous observations and experiments, that the descending or nutritive sap becomes ascending in buds, in the peduncles of fruits, &c. He records, among others, the following fact. A vertical root of a tree was accidentally exposed for a considerable extent; the inferior extremity remained covered with earth, and a small sucker was observed at a short distance from the trunk. This root was divided during the winter below the sucker, and from this time was deprived of the ascending or lymphatic sap; it nevertheless vegetated and increased in size. This proves that the lymphatic sap descended from the trunk for its nourishment; for other roots under the same circumstances, but deprived of the bud or sucker, rapidly dried. Hence, M. DUTROCHET justly concludes, that the flow of the sap in a direction contrary to what it

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* This fact is recorded by RICHERAND in his Physiology, (American edition, p. 13) who states that it occurred under his own observation.

† L'Agent immediat du mouvement vital, &c. par M. DUTROCHET, Paris. Vide Review of this work, in the present number of this Journal.

had originally pursued, was owing to the vital action of the sucker. This vital action, on whatever it may depend, whether on electricity, nervous fluid, or any other source, was certainly manifested by an enlargement of vessels and the consequent attraction of fluids.

f. Another fact in the physiology of vegetables tends to the same conclusion. When the branch of a tree is cut off, the stump dies, provided no branch, twig or bud exists between its extremity and the trunk; showing that the vis a tergo from the roots and other parts will not continue the flow of sap even in living tubes, unless assisted by an attractive power in the peripheral system of vessels*.

From the above statement it results that the motion of fluids in vegetables is influenced in a very important manner by a dilating power chiefly resident in the capillary tissue of their roots and branches. Expansibility is requisite not only for the absorption of fluids, (Proposition II. *b*, *c*); but also for the distribution of these fluids to every portion of the plant in proportion to the degree of local excitement. The capillary tissue of the roots and that of the branches harmonize for the accomplishment of an object, for which either separately is inadequate.

2d. *In Animals.* As we ascend in the scale of animated exist-

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* That there is a vis a tergo operative in the circulation of the sap every one will admit. M. DUTROCHET has devoted much attention to ascertain satisfactorily its existence and source. He alludes to the experiment of HALES, repeated and confirmed by MM. CHEVREUL and MIRBEL, of adapting a glass tube, partially filled with mercury, to the cut extremity of a truncated vine; the mercury was elevated 30 inches above its primitive level by the force which expels the sap. To ascertain the seat of this impulsive force, M. DUTROCHET cut off in succession different portions of the branches and trunk of a vine in which the lymphatic sap was abundant. He found that the flow of sap was immediately arrested in the part detached, but continued in the part attached to the root. Hence he inferred that the power resided in the root. Having removed the earth around the root, transverse sections were repeatedly made, and he found that the sap always issued from the inferior surface. The sections were continued until the smallest radicles (le chevelu) were divided with the same result, proving that the impulsive force given to the sap originated in these minute portions of the root; and that the spongioles, or extreme conical terminations of the capillary radicles, hitherto regarded as the agents of absorption only, ought also to be regarded as the origin of the expulsive force of the sap.

It is needless to comment on the analogy thus proved to exist between the capillary vessels of vegetables and those of animals—each of them possessing a dilating or absorbing, and a contracting or expulsive power, alike necessary for the circulation of their fluids.

ence, the vital functions become more numerous and complicated. The lower order of animals, *the invertebral*, differ very little from vegetables in the mode of their existence, absorbing and circulating their nutritious fluids apparently by the same powers and a similar apparatus. The *vertebral* animals, forming the second of CUVIER's divisions, have an additional organ, more or less perfect, for increasing the impetus of their fluids. This new organ, the heart, is given, not as a substitute for capillary influences, but as an assistant, demanded by the increasing wants of the system.

These observations we shall endeavour to maintain by facts, proving that the capillaries of animals, like those of vegetables, attract fluids from the large vessels, and thus materially assist the vis a tergo, and also that this capillary influence, in many instances, is alone adequate to cause the motion of the blood.

A. Capillaries draw blood into their cavities.

g. Dr PHILIP and Dr HASTINGS* state, that in live dissections, the circulation in the smaller vessels will continue for several minutes after excision of the heart. In the mesentery, Dr PHILIP has observed that the circulation proceeded with regularity for half an hour after the removal of the heart†. If contraction were the only vital action, the blood would be driven out of the small vessels; and as no vis a tergo existed from the heart, their dilatation could not occur, but the vessels would remain collapsed and the part bloodless, as in syncope and local asphyxia. Professor HORNER also informs us, that during live dissections, the capillary vessels remain distended, after the heart has ceased to act, and so long as any blood remains in the arteries,—the larger vessels becoming first empty, then the smaller ones, and finally the capillary tissue.

These phenomena cannot depend on mere vital contraction of the vessels: for such contraction would occur more readily in the capillary system, the irritability of which is greater than that of the arteries; and this contraction would not, as shown in Proposition I., be overcome by the vis a tergo from the contraction of the arteries. Hence, the influence from the heart being removed and the capillaries contracting, the blood would remain in the arteries, on the supposition that contractility were the only vital property. But the arteries are found empty before the circulation has entirely ceased

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* Essay on Bronchitis, p. 51.

† Essay on Vital Functions, 2d edition.

in the capillaries, and while these last remain turgid. The capillaries hence manifest a dilating power, drawing blood into their cavities, and assisting the arteries in discharging their contents. This being effected, the contractile powers of the capillaries throw the blood eventually into the venous system where it remains. In this way, I think, the emptiness of the arteries after death may be satisfactorily explained.

h. The above explanation is confirmed by attending to those few cases in which the arterial system remains distended: as when death has been suddenly caused by some powerful impression, as by lightning, a blow on the stomach, &c. Here the whole of the circulatory apparatus appears to be paralysed, and the blood is generally found fluid. No vascular action continuing after the cessation of the vis a tergo from the heart, the blood remains at rest.

i. Stimuli cause an afflux of fluids to the part irritated. In Proposition II. *g*, *h*, *i*, *k*, various examples were detailed to prove the active enlargement of the vessels under irritations: in all such cases, fluids flow in increased quantities to the part. Whence this afflux? It is not owing to a vis a tergo from the heart and arteries; for this remains as before, and the capillaries are not debilitated (Proposition II. *g*, *h*, *&c.*). And even if they were debilitated, the part would not be distended by the vis a tergo (Proposition I.), and of course no increased flow could occur. The fluids are evidently attracted to the part irritated, and, as dilatation must precede their entrance, I infer that such dilatation, excited by stimuli, is the immediate cause of all such local determinations of blood. This view is confirmed by the fact, that the afflux is proportioned to the irritability and vascularity of the part and to the severity of the stimulus. They increase and decrease *pari passu*. The contraction of the heart, acting upon a single column of blood, can have no effect in increasing or diminishing the flow of blood to any tissue. Such local changes depend therefore on local causes, and chiefly on the varying degree of excitement in each part.

k. The influence of the capillaries in drawing blood from the larger vessels is often exemplified in the operation of sinapisms, blisters, and other rubefacients in prostrated states of the system,—where the surface is cold and pale or livid, where the pulse can hardly be felt, and the phenomena of life are almost extinguished. What is the modus operandi of such remedies in exciting reaction? Do they first increase the vis a tergo, the actions of the heart and

arteries, that the capillaries may be distended? or do they not primarily excite the torpid capillaries, whence dilatation and afflux of fluids, and afterwards, secondarily and sympathetically, the arteries and heart? The last view seems correct, because such local irritations are often excited, when the arteries and heart do not sympathize; and in all cases, the capillary excitement precedes the general excitation.

l. The suction power of the capillaries is exemplified in some cases of nævi materni and in aneurisms from anastomosis. Dr SMITH, in his essay (p. 251), relates the case of a lady who had a vascular tumour on the neck, somewhat pendulous. A hemorrhage often occurred, sometimes guttatim, occasionally in a stream, and in many instances, was excited by mental agitation. The excitement of mind, prior to its extirpation, brought on a bleeding; but when the tumour was removed, not three drops of blood were effused from the incised wound. If the original hemorrhage were owing to a vis a tergo, the bleeding should have been augmented, for larger vessels were opened, and the action of the heart and arteries was undiminished; but in this case "the vascular tumour seemed to operate like a pump attracting the blood from the surrounding parts, and discharging it from the system." All surgeons notice the danger of cutting into such tumours, and yet, as Dr SMITH observes, no one hesitates to extirpate them by making incisions into the surrounding parts.

m. Acute dropsies and hemorrhages prove not only the dilating power of the capillaries (Proposition II. *q*), but their suction influence; for although such effusions usually occur when the general circulation is excited, yet they are often met with, when the vis a tergo is at or even below the healthy standard. In these cases, the discharge being augmented, and the vis a tergo lessened, the supply must be kept up by the absorbing or suction influence of the irritated vessels.

This opinion is confirmed by the facts adduced in Proposition I. showing that dilatation was not the result of a vis a tergo, and also by an experiment of BICHAT, who endeavoured, but unsuccessfully, to produce effusion by injecting the vessels of a living animal. The vessels will only enlarge when appropriately stimulated.

n. The reunion of parts which had been entirely separated from the body, a fact now well attested, shows that capillaries absorb fluids from supplying vessels. An amputated finger, when pale, bloodless, and apparently dead, reapplied to the stump, will have its

circulation restored, certainly not by a vis a tergo, nor by a contraction of its own vessels, but by a suction power in these vessels; so that the fluids effused by the stump are absorbed for the nourishment of the injured member. Mr HUNTER's well known experiments of transplanting teeth, spurs of cocks, &c., succeeded on the same principle.

o. The rapid enlargement of the capillary and smaller arteries after the main artery of a limb has been tied was alluded to in Proposition II. *l.* The afflux of fluids to the cold and bloodless limb is no less evident than the dilatation of the vessels, and as the vis a tergo is diminished, while the redness and temperature are augmented, we must infer that the blood was moved by some other power than that derived from the heart and arteries; that the excited capillaries absorbed blood from the superior portions of the limb.

Dr N. R. SMITH, of the University of Maryland, records an interesting example of this kind*, in which a ligature was applied to the anterior tibial artery for a wound of this vessel. The hemorrhage from the wound, and the pulsation of the artery on the top of the foot, ceased on drawing the ligature; but after some hours, the bleeding returned from the inferior orifice. The artery on the instep now pulsated vigorously, the beat was stronger and more full in the wounded limb than in the other, and the blood on experiment was found flowing in a retrograde direction. The circulation here was more rapid by anastomosing channels than when the blood pursued its direct course.

p. Professor SMITH was called upon to amputate the leg below the knee for a dry gangrene of the foot and ancle. The great arteries were found ossified, being mere tubes of bone. "Though all pressure was removed from the artery above, and no other means were used to suppress the hemorrhage, yet not half a table spoonful of blood followed the operation. At the same time, the action of the heart, and of the arteries at the wrist, was vigorous."—p. 205. As no coagula existed in the arteries, and as the anastomosing vessels were not enlarged while the parts below had been supplied with some blood, it results that blood must have passed through these ossified tubes before the operation, and that its motion was not owing to the vis a tergo, as the open ossified tubes did not bleed when

* Philadelphia Monthly Journal, vol. ii. p. 18.

divided. Hence "the active power lost by the division of the arteries, resided in the capillary system of blood vessels of the foot and leg."

Similar remarks may be predicated of all large arteries passing through bony canals. In the sturgeon, a large portion of the principal artery passes through cartilage or bone. Hence we infer that the circulation of blood in the large vessels is dependent on a suction power in the capillaries as well as on the vis a tergo. Other facts confirm this important doctrine.

q. The circulation of blood in the placenta proves the suction power of the capillaries*. The impetus the blood possesses in the umbilical arteries is attributed solely to the vis a tergo; but it is well known that after the detachment of the placenta from the uterus at the birth of a living child, the pulsation in the cord ceases—first near the placenta, and finally at the umbilicus of the infant, and that a section of the cord in such cases is not followed by hemorrhage. Why does the flow of blood cease in these tubes? The vis a tergo is as powerful after birth as before, and yet no hemorrhage is caused, when this impetus is operative on blood in tubes free from obstruction. Dr SMITH says it certainly will not be attributed to cold, for the circulation continues in every part of the infant; nor to exhaustion from hemorrhage, for the fœtus loses no blood, as its circulation is independent of the mother. Neither is it owing to the lungs diverting blood from the placenta; for although a greater portion of blood is carried to the lungs after than before birth, yet this would not account for the cessation of the circulation in vessels so large as the umbilical arteries. Animals die from hemorrhage when divided arteries of their size remain unsecured. The solution therefore on common principles is not evident. From those now advocated, it results, that as the organic vital actions of the placenta depend on the parent's system; when this body is detached from the uterus, the functions of the capillary tissue cease. The small vessels by their suction power no longer assist the vis a tergo in carrying the blood through the umbilical arteries, and this last being by itself inadequate to this object, the circulation declines first in the placenta and finally at the umbilicus.

r. Surgeons have occasionally operated for the cure of aneurism,

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* Professor SMITH, Phil. Monthly Journ. vol i. p. 252.

by tying the artery *beyond* the tumour. On the common doctrines of the circulation, the obstruction to the artery would increase the impetus of blood, and the swelling would thus be aggravated; but experiment proves that the tumour gradually ceases to pulsate and diminishes in size*. The vis a tergo, deprived of the assistance of the suction power of the capillaries, is not adequate for the enlargement of an aneurismal tumour.

s. As already noticed (Prop. II, *y*), the brachial artery enlarges in varicose aneurism at the bend of the arm. In this case, as part of the arterial blood is lost by the vein, the wants of the capillaries are not sufficiently satisfied; hence a greater quantity of blood is required in the injured than in the sound limb. The vis a tergo operating equally before and after the injury cannot satisfy this increased demand, unless assisted by some local attractive power. The suffering capillaries therefore draw the blood to them; the artery is sympathetically excited, enlarges, and thus admits the necessary supply to the injured member. The experiment of PARRY (Proposition II. *z*), showing the enlargement of one carotid when the other was tied, is a similar fact, alike evincing the attractive influence of capillaries and the consequent sympathetic enlargement of the supplying vessels, until they satisfy their demands. Vide also Proposition II. *s*, *t*, *u*, *v*.

t. The hemorrhage after amputations is trifling when compared to that arising from the division of the same arteries under other circumstances†. Very often the surgeon has merely to secure the main artery, and occasionally, no ligature is required. Professor SMITH has three times amputated below the knee without employing a single ligature; there was no faintness and no unusual diminution of the vis a tergo in these cases: and a German surgeon, Dr L. KOCH, has lately affirmed‡ that neither he nor his father have ever applied ligatures, even to the femoral artery, after numerous amputations in a practice of twenty years. On the contrary, every one is acquainted with the difficulties and dangers attending the division of even small arteries in a healthy limb, giving rise to extensive ecchymoses, to false diffused and circumscribed aneurisms, and often baffling the best efforts of the most scientific surgeon. Whence this difference, un-

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* Vide North Amer. Med. and Surg. Journ. vol. i. p. 388, and vol. v. p. 227, for a notice of these operations.

† Professor SMITH, p. 203, Op. cit.

‡ Jour. des Progrés—and Am. Jour. of the Med. Sci. vol. i. p. 462.

less that in the one case, the influence of the capillaries has been removed by the knife of the amputator, while in the other, blood i continually drawn into the limb by the capillaries, suffering from the loss of blood. (Vide sections *o* and *s*).

u. Certain states of the system appear to me to confirm the opinions here advocated, and to demonstrate their practical importance. Every experienced physician has observed, especially among intemperate patients, cases, in which the vital energies of the capillaries are prostrated; the surface being cold, clammy, and livid or pale, while the heart and large arteries are in vigorous action,—the pulse being full and tense. This condition is very dangerous; for the heart and arteries under these circumstances soon cease to propel the blood, and the patient perishes, unless the capillaries recover their powers.

The reverse is also true, that patients with an active capillary circulation, and yet with a weak action of the heart and arteries, are comparatively safe. The blood continues its motion with facility when receiving but a trifling impetus from the heart, so long as the capillaries are active; but when these are prostrated, a powerful vis a tergo from the heart and arteries fails, not only in dilating the peripheral system of vessels, but in sustaining the circulation of the vital fluid. Congestion of the large viscera and death soon succeed.

B. The capillaries, thus endowed with expansibility as well as contractility, are often alone adequate for the circulation of the blood.

v. In the invertebral animals, there is no heart; the fluids taken up by the absorbents being propelled by powers analogous to those possessed by vegetables. Proposition III. *a*, *b*, *&c.*

w. In fishes, the heart is single, and is devoted to the lesser circulation in the branchiæ or gills. The general or systemic circulation receives no other assistance from this organ than what may be communicated through the capillaries in the branchiæ. In some fishes, as the sturgeon, the main artery passes through cartilage or bone, thus depriving the blood of the influence of its contractions.

x. The blood in the vena portarum cannot be propelled by the heart and arteries, except through the capillaries of the spleen, pancreas, stomach, and intestines. Its motion, therefore, like that of the sap in vegetables, must chiefly depend on the vessels, forming its roots and branches.

y. The same observation is true, *a fortiori*, as regards the blood in the umbilical vein.

z. We find also from the experiments of HALLER, SPALLANZANI, BOYER, PHILIP, THOMSON, HASTINGS, and GENDRIN, that the blood in capillaries will often flow to an irritated point, and in cases of obstruction, be diverted to other parts, in opposition to the vis a tergo from the heart and arteries.

From the facts and arguments which have been presented for the support of the present Proposition, it results that the contraction of the heart and arteries is not of itself adequate to the propulsion of the blood; and that capillaries, possessing a dilating power, draw blood into their cavities, and thus assist the impetus derived from the heart. The combined influences, derived from the contraction of the heart, arteries, and capillaries, impel the blood forward into the veins, where further assistance is rendered by the contractile power of these vessels, and when near the heart, by the suction influence of this organ* and of the thorax†. All parts of the circulatory apparatus thus assist each other, instead of furnishing obstacles to the circulation of the blood, as maintained in the present systems of physiology.

That none of the arguments drawn from the state of the parts in inflammation may be invalidated, I shall add a fourth Proposition respecting the circulation of blood in inflamed parts.

PROPOSITION IV.

During the activity of inflammation, an increased quantity of blood flows through the affected part.

It is contended by PHILIP, HASTINGS, and most English writers, that the blood moves slowly through inflamed parts, and that it becomes nearly or altogether stagnant. A large proportion also of the continental pathologists, Dr PRUS not excepted‡, while maintaining the vital erection of the inflamed tissue and the activity of the capillaries, acknowledge the stasis of blood during the inflammatory process. The capillaries, they say, are ineffectually labouring to transmit the blood, and their coats, like the sides of an obstructed hose, continually but unsuccessfully react on the contained

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* Proposition II. *aa*, *bb*, &c.

† HUNTER, CARSON, BARRY, &c.

‡ Op. cit. p. 62.

fluid*. There is, however, no evidence of obstruction during inflammation. This is a conceded point among modern pathologists, who also admit that obstruction would not give rise to the phenomena of inflammation. Prop. I. *f*.

In support of the opinion that the circulation is more active in inflamed tissues, the following facts may be appealed to with much confidence.

a. The colour of an inflamed surface is brighter, resembling that of arterial blood. Whenever the motion of blood is retarded, the part becomes of a dark livid or venous colour; as observed when the circulation is impeded by ligatures to veins, by bandages to the extremities, or by a dependent position. The dark colour is also noticed in parts exposed to cold; in typhous and malignant fevers; in intemperate patients; in gangrenous surfaces; and in patients in articulo mortis.

b. The temperature of the skin when inflamed is increased, as proved by the experiments of Mr Hunter and Mr A. Cooper. This is indicative of activity in the circulation, as a cold surface denotes its depression.

c. Pressure made on the capillaries empties them of blood, and when this pressure is removed, the blood returns with great rapidity during inflammation, but very slowly in torpid states of the circulation.

d. Incisions made into inflamed parts are followed by a free hemorrhage, which can with difficulty be restrained. The blood is emitted not only in greater quantity, but with greater impetus and of a brighter colour.

e. Large quantities of blood are conveyed to an inflamed part, as manifested by the fulness, tension, and pulsation of the supplying arteries, and by the force with which they throw out blood when divided. What becomes of the blood thus abundantly conveyed? If this fluid were stagnant in the capillaries, rupture or gangrene would speedily ensue from the impetus and quantity of blood thus driven into the engorged capillaries.

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* The writer of the article Circulation, in the Dict. Abrégé des Sci. Med., admits an increased circulation in inflammation, unless perhaps in chronic inflammation. Gendrin, in his review of Thomson, Jour. Géneral, Aug. 1827, p. 319, says, that vessels in inflammation become more permeable, and that the circulation is at first greatly accelerated, but finally becomes arrested.

f. The veins coming from an inflamed part are enlarged, and this in greater proportion, says Mr Home, than the supplying arteries. Their size increases also in proportion to the intensity of the inflammation until gangrene occurs. Hence I infer, that more blood comes from an inflamed part.

g. That the blood carried to an inflamed part is not stagnant, or even retarded in the supplying arteries, in the affected capillaries, or in the receiving veins, is further demonstrated by the change of colour, and the increase of pain and swelling produced, when the circulation is impeded by a dependent posture, or by ligatures or bandages pressing on the veins; and by the force with which blood is emitted from a receiving vein when punctured, by the bright colour of the blood thus effused, and by the pulsatory motion which it often exhibits under these circumstances*.

h. The abundant secretions of serum, lymph, and of pus, so frequently observed, could not be formed without a free supply of the pabulum vitæ. So also, the reunion of divided parts and the generation of new substances, demand a greater supply of blood as well as a more active exercise of the vital properties than simple nutrition.

The phenomena and consequences of inflammation thus evince the close analogy which exists between this morbid state and those various processes of the animal system, in which every one recognizes an increased circulation; such as the renewal of a stag's horns, the growth of tumours, the erection of the penis and nipple, the enlargement of the uterus, the distention of the mammæ, and the subsequent secretion of milk, &c. The one class of phenomena manifests as decidedly as the other all the evidences of capillary excitement, and of an increased flow of blood through the affected tissues.

If the object of this essay has been attained, it results that expansibility is a vital property, as well as contractility, and that both are modifications of the irritability of many modern pathologists: that the heart, arteries and capillaries, possess this property of dilating under the influence of their normal stimuli, but do not enlarge from any vis a tergo to which they are subjected; and finally, that they contribute by active expansion and contraction, at regular

* This has been observed by many practitioners. Vide Hunter on the Blood, &c. p. 161. 163.

or irregular intervals, to the ready transmission of that vital fluid which is essential not only to secretion and nutrition, but also to reparation.

ARTICLE II.—*Observations on Hereditary Hemorrhage.* *By* REYNELL COATES, M.D.

There are several families, in various parts of the United States, affected with a singular predisposition to hemorrhage from very trivial injuries. Dr OTTO, of this city, has written a paper, which will be found in the sixth volume of the New-York Medical Repository, giving an account of this idiosyncracy, as displayed in the descendants of a Mrs Smith, who settled in the vicinity of Portsmouth, N. H. about eighty years previous to the date of his communication. Nearly all the male progeny of this lady were subject to dangerous and often fatal hemorrhage from the slightest wounds or scratches; nor could the most enlightened professional skill suggest any effective remedy, until it was accidentally discovered that the *sulphate of soda* exercised a control over these cases, as unaccountable as the affection itself.

The females of the family never exhibited this predisposition, although they transmitted it to their male issue. Those who were affected were robust men of a choleric disposition, and many of their neighbours supposed that they could distinguish the "*bleeders*," as they were called, by certain peculiarities of personal appearance.

Another paper, by the same gentleman, published in Coxe's Medical Museum, vol. i. contains the particulars of the fate of four sons of Mr Benjamin Binny in Maryland; the first of whom lost his life by a hemorrhage, occasioned by the "kick of a horse over the eyebrow;" the second, from "the fall of a brick on the forefinger while at play;" the third, from "a cut over the eye from the swing of a gate as he was passing through;" and the fourth, who was subject to frequent attacks of epistaxis, fell a victim, in early life, to dropsy, consequent to the loss of blood. Physicians attended each of them, but to no purpose. The females of this family, also, were exempt from the affection.

Dr Otto mentions that Dr Rush was twice consulted in cases of the same hereditary tendency. Dr Physick recently informed me, that he had attended a patient, about thirty years ago, in whom a slight cut upon the knee produced a very obstinate hemorrhage of a similar character; and I have lately been informed of two other families, one in Pennsylvania, and the other in Georgia, in which this idiosyncracy is strongly marked.

These instances are sufficiently numerous to render the history of the disease highly interesting to those practitioners who reside in the neighbourhoods where it prevails, and to such I hope the following case, in which I was recently consulted, will prove worthy of perusal. If the details of treatment should be considered unnecessarily minute, I must rest my apology upon the desire to avoid that careless and generalizing style of description, which renders too many reports of this character altogether useless to those, who appeal directly to facts, and who are unwilling to place implicit confidence in the deductions of others.

R. W. a young gentleman from Delaware county, Pennsylvania, a member of the medical class, was the first of his family to display the idiosyncracy, which is the subject of the present paper. His frame is vigorous, and he has every appearance of health.

His sister has never exhibited any uncommon disposition to hemorrhage, but, among her children, the following cases have occurred. A child, aged about eighteen months, fell and ruptured the frœnum of the upper lip. Two of the most respectable practitioners of the neighbourhood exerted themselves to save the patient, but in vain: he bled to death.

Another child, aged about fifteen months, met with the same accident. Three physicians were consulted; but the hemorrhage continued until the third day after the injury, when the child was taken to Dr Gideon Humphrey, in a state of extreme exhaustion. This gentleman succeeded in arresting the bleeding by means of the actual cautery.

The same child, when nearly thirteen years of age, received a cut upon the forehead by a blow from a stone, and was attended by two practitioners who employed the actual cautery freely, but without effect: the patient fell a victim to the hemorrhage.

These cases are mentioned by Dr Humphrey in the Medical Review for September 1824. The slight discrepancy between the statements contained in that paper and the account here given, is

owing to the fact, that the former was published from rough notes, taken long after the event occurred, and not intended to meet the public eye; while the latter has been corrected by referring anew, to Dr H., and also to the family affected.

Dr H. has since narrated to me two other cases in the same family. In the first case, which occurred in the brother of the children already mentioned, *a slight contusion* of the scrotum produced an enormous extravasation in the cellular tissue; and in the second, a wound of the thumb was followed by bleeding for several days. The *shower bath* suddenly arrested the hemorrhage.

R. W., the gentlemen above mentioned, received a cut from a penknife on the forefinger, when about eleven years of age. The wound continued to bleed without intermission; and on the fifth day after the accident Dr HUMPHREY was consulted. He applied a compress and bandage, "sufficiently tight to stop the discharge;" but on the following day he found the finger considerably inflamed, and the hand and forearm distended with extravasated blood. On removing the compress, the blood again flowed from the wound. The Doctor then applied remedies to combat the local inflammation, and continued them for a few days. The bleeding, however, did not cease, and the patient being in an extremely exhausted condition, the actual cautery was applied with complete success.

In the autumn of the same year, Mr W. had a molar tooth extracted. Blood continued to ooze from the gum for many days, nor was the hemorrhage checked, until the actual cautery was liberally employed as a last resort.

I shall now proceed to give the details of another similar attack, occurring to the same gentleman, when 24 years of age, as extracted from my case-book.

22d December 1827, 5 o'clock, P. M. I was requested by Mr (now Dr) SPACKMAN to visit Mr W. who had a tooth extracted by a dentist the day before. The patient and his friends informed me, that the hemorrhage following the operation was so profuse and of so long continuance, that the dentist, at the request of Mr W., applied the actual cautery, but without success. Mr SPACKMAN took charge of the case at 10 o'clock, A. M.; but being unable to check the discharge, he thought it advisable to call in additional aid.

The patient had lost at this time about half a gallon of blood. The measures resorted to by Mr S. were as follows:

1st. The sulphate of copper was applied, in the solid form, to the bottom of the socket without effect.

2d. A piece of cork, adapted to the form of the cavity, and wet with a strong solution of the same salt, was employed as a compress, with no better success.

3d. The cavity was plugged with lint, but without any benefit.

4th. A saturated solution of the sulphate of alumina was employed as a gargle; but this did not arrest the bleeding.

5th. A piece of sponge, imbued with this solution, was employed as a compress; a piece of cork was applied over it, and pressure was made by means of BARTON's jaw bandage. This apparatus arrested the hemorrhage, but it returned in four hours.

6th. Dry sponge covered with powdered sulphate of alumina was applied, and secured in the same manner. This application lessened the amount of discharge considerably, but did not entirely check it.

At the time of my visit I found Mr W. weak and pale, with a pulse small and frequent, but quite mild. His stomach was irritable. The bleeding at this time being slight, I did not think proper to advise the removal of the dressings; but recommended that the patient should be kept cool and quiet, in the hope that the hemorrhage might cease, without obliging us to resort to more severe measures.

23d December. I was called to Mr W. in haste, at 10 o'clock, A. M. and found him bleeding profusely. The dressings were removed, and in order finally to test the effect of pressure, applied in the most careful manner, I proceeded to plug the cavity of the socket with dry lint, firmly impacted by means of a bent wire. Over this was placed a firm compress of lint, surmounted by a piece of cork, upon which the inferior jaw was strongly closed, by means of BARTON's bandage. This apparatus totally suppressed the discharge until after daylight, when it returned.

At 10 o'clock, A. M. the hemorrhage was very considerable. I reapplied the compresses, moistened with a saturated solution of sulphate of copper. The bleeding was rather less profuse for half an hour; but after this time it became even more copious than I had yet seen it.

At 11 o'clock, Mr SPACKMAN being present, we made a very careful examination of the wound, and discovered that no blood escaped from the socket of the tooth, but, on the contrary, that the

discharge took place from one angle of the incision made by the gum lancet, just within the tooth next adjoining, which was the first of the molares. The whole cheek and gum were much swelled and inflamed, in consequence of the pressure which had been employed; and there was some febrile action. The actual cautery was now applied to the bleeding surface, and the hemorrhage became instantly arrested. The patient was ordered to take a purge of the sulphate of magnesia immediately; to be followed by the acetate of lead and the nitrous powder*, alternately exhibited.

At the request of the patient, Dr GIDEON HUMPHREY was called in consultation.

At 3 o'clock P. M., Dr H. met us. The hemorrhage was very slight and no change of measures was proposed. Dr H. stated that, in all the cases occurring in this family, pressure invariably occasioned severe inflammation, without producing any benefit.

At 11 P. M. I found the hemorrhage as profuse as ever. I reapplied the cautery freely and checked the discharge.

26th December. I did not see the patient on the 24th or 25th, concluding that as I had not been sent for, the case had terminated favourably. Mr SPACKMAN, however, informed me, that the hemorrhage had recurred on the morning of the 26th, and continued without intermission, *notwithstanding the application of almost every styptic, which suggested itself to Mr W. and his attendants.* Most of the remedies appeared to lessen the flow for a short interval, but their ulterior effect was rather to increase it.

At 10 o'clock this morning I called, and found the patient absent. Weak as he was, he walked to Dr H.'s office, where the cautery was again applied very freely to the inner flap, the bleeding being confined to that part only. The discharge was again checked, but returned as violently as ever on his arrival at his own residence. The cautery was frequently reapplied by myself and others during the day and night, but without permanent advantage.

27th December. The consultation met at 10 o'clock, A. M. The local inflammation had in a great degree subsided. Mr SPACKMAN stated to us, that, at 1 A. M. Mr W. had been attacked with vomiting, purging, and considerable pain about the colon. With a

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* The nitrous powder contains nitr. potass. grs. x. with tart. antim. gr. 1-6th. It is a formula employed in the practice of the Pennsylvania Hospital.

view to relieve these symptoms, Mr S. exhibited calomel, grs. iii. cum pulv. opii. gr. i. and directed tinct. opii, gtt. xxx. quâque tertiâ horâ sumend.

The patient was now free from fever, and the purging had ceased, but the stomach continued irritable. This symptom was relieved by a spice plaster to the epigastrium, and a Seidlitz powder, which operated freely. The hemorrhage was very profuse, and the patient extremely exhausted. Tinct. opii continued.

It was resolved to day to make a final conclusive trial of the cautery, under the idea that some portion of the flap might have escaped contact with the iron. I, therefore, proceeded to destroy, by this means, not only the wounded surface, but the whole thickness of the gum, and surface of the socket. The blood continued to ooze rapidly through the substance of the slough, and about an hour after the application of the iron, I *distinctly saw the hemorrhage proceeding from the surface of the uninjured* gum, at some distance from the sloughs. This exudation continued for a short time only.

At the request of the friends of the patient, Dr J. R. Barton was invited to join us in consultation.

At 2 P. M., the consultation met. Hemorrhage considerable. The blood contained very little fibrin. The patient was exceedingly pale, and his pulse very weak, but perfectly mild. The amount of discharge since the commencement of the case certainly exceeds two gallons. It was agreed that a nourishing diet had become indispensable. He was, therefore, ordered to take plentifully of soups and jellies. Eggs were also allowed him. Port wine was directed to be given pretty freely, and the spirit of turpentine was prescribed, fifteen drops to be taken every two hours.

At 6 P. M. I called. Mr W. had taken about half a pint of Port wine. The spirit of turpentine was immediately rejected from the stomach. The patient had considerable fever, with some stupor and pain in the head. The Port wine and turpentine were therefore omitted, and gruels and beaten eggs, directed to be taken freely: mustard plasters were applied to the feet. During the following night, the hemorrhage declined, *and ceased entirely for an hour after a warm breakfast.*

28th December. At 10 A. M. the consultation met; Dr Humphrey absent. The patient was free from fever, and the bleeding

not very profuse. The exhibition of Port wine was renewed, and HUXHAM's tincture of bark was prescribed.

12 P. M. Found considerable fever, the pulse beating 122 strokes in a minute, and the hemorrhage profuse. Applied the muriated tincture of iron, and at the earnest desire of the friends, permitted the application of a popular remedy, the oil obtained from burnt linen. Both these articles lessened the discharge for a short time, but ultimately produced an exacerbation. The compound tincture of bark being invariably rejected, its exhibition was discontinued.

29th December. At 11 A. M. the consultation met. Mr W. informed us that the hemorrhage had not abated, until he had taken breakfast, after which *it had stopped for half an hour.* At the time of our visit, it was considerable. The fever had somewhat abated; pulse 115. Notwithstanding the free purging which followed the exhibition of calomel, two days before, a strong mercurial odour was perceptible in the patient's breath. Ordered sulph. quiniæ, gr. i. q. tertiâ. hor. sum., et tinct. ferri, gtt. v. q. hor. sum. *Tinct. opii continued.*

At the desire of the friends of the patient, Dr PHYSICK was requested to join us in consultation.

At 4 P. M. Dr P. and myself met, the other gentlemen being absent. One important indication in the treatment of hemorrhages from the mouth in general was suggested by Dr P. He stated that he had met with instances of extreme exhaustion from bleeding, consequent to operations in that cavity, and which continued after all the remedies, usually resorted to, had been employed to no purpose. These discharges he supposed might be kept up by the suction, unavoidably attendant upon the effort to swallow, and were to be arrested by keeping the mouth permanently open.

In order to answer this indication as completely as possible in Mr W.'s case, a plug of wood was introduced between the molar teeth, and he was ordered to receive nourishment through the stomach tube. He was also confined to a sitting posture; and in order to ascertain whether the coagulation of the blood upon its exit would not prove serviceable, when aided by the means just mentioned, it was directed that a slight pledgit of common spunk should be kept in contact with the bleeding surface.

The introduction of the stomach tube was strongly resisted by the patient, under the impression that some injury might be sustained by

the œsophagus, in which case a second hemorrhage, less accessible and consequently more unmanageable, might result.

At 1 P. M. the bleeding continued unchecked, notwithstanding the introduction of the plug, which the patient was compelled to remove in about an hour, in consequence of the nausea occasioned by its presence. He took one egg beaten up with sugar and water, and this was his only sustenance for twenty-four hours.

At 11 P. M. I reapplied the plug, but the extreme irritability of the fauces rendered its presence intolerable, and Mr W. removed it at 1 o'clock, A. M. He then continued to hold spirit of turpentine in his mouth for some hours, at his own suggestion; but this increased the hemorrhage very considerably.

Dec. 30th. At 10 A. M. we met. We were informed that the patient had taken plentifully of warm tea for breakfast, after which the hemorrhage *was much diminished for some time.* The mercurial odour could no longer be detected in the breath.

At 4 P. M. Mr Spackman having procured some spunk, introduced a wedge shaped plug between the molares of the injured side, surmounted by a pledgit of that article, according to the directions of yesterday. The hemorrhage, although somewhat lessened for a short interval, ultimately became still more violent. I afterwards carefully reapplied the same apparatus, with a similar result.

The patient was soon afterwards attacked with vomiting and purging. Mr Spackman exhibited laudanum freely, and these symptoms were soon relieved. He then reapplied the plug with temporary benefit; but Mr (now Dr) Temple, in whose charge the case was placed for the night, states that the bleeding became very profuse in a short time. At 3 o'clock, A. M. efforts to vomit rendered it necessary to remove the plug. The patient was now extremely weak, having nearly fainted on attempting to rise. After the final removal of all local applications, the hemorrhage ceased in a little while, *and did not again return until* 5 P. M.

Dec. 31st. At 10 A. M. we again met, all the gentlemen being present. The patient had taken plentifully of rich broths, rice pudding, and other nutritious articles, not requiring mastication. This diet was ordered to be continued. He was directed to prevent the entire closure of the teeth, *but not of the lips*, by inserting a small piece of cork between the incisors. The amount of tinct. opii was reduced to gtt. xxx. every four hours. At 5 P. M. the hemorrhage returned, after a slight febrile paroxysm, accompanied by chilness

and headach. It continued to flow, gently, until 3 o'clock in the morning.

1st January 1828. In the afternoon of this day there was a slight return of bleeding, which continued two hours, and then finally ceased. The whole amount of blood lost during the progress of the case cannot be estimated at less than three gallons.

It is proper here to remark that Mr W. has received several wounds from the sickle, while engaged upon his father's farm. One of these, which was a severe and deep cut upon the hand, produced no unusual discharge of blood, but several others, of less extent, required the application of the actual cautery. The slight scratches occasionally inflicted by the razor seldom caused any trouble.

Remarks.—Whether the effects of pressure are similar in all cases of this strange idiosyncracy, is a question that cannot be determined from the limited evidence which is at present within my reach; but it is evident that among the relations of Mr W. it is not only unavailing, but even productive of much inflammation, and, in some instances, of extensive ecchymosis. In the case just narrated, it will be perceived, that pressure, in common with many of the styptics employed, exerted some control over the discharge upon its first application; while it eventually produced an exacerbation, by increasing the local irritation.

During the first few days, the patient ate but little, and, as he was at the same time freely purged, his strength rapidly declined; but after a generous course of diet was instituted, the disease became more manageable. It was curious to observe how regularly the hemorrhage intermitted after breakfast, which was his most considerable meal. This effect was probably owing to the concentration of blood about the stomach, during digestion, acting in the manner of a counter-irritant. A plentiful supply of food appeared absolutely necessary, to support the patient under the immense drain to which he was subjected; but the effect of the tonic and stimulant remedies resorted to towards the close of the case, sufficiently prove, that however great the debility may be in such cases, *no benefit is likely to result from any thing which tends materially to increase the activity of the general circulation.*

The actual cautery, so generally successful in former injuries occurring in this family, failed entirely in the present case; and it is worthy of remark, that the temporary benefit resulting from it, be-

came less apparent, in proportion to the severity with which the process was conducted.

The employment of cauterizing irons is so exceedingly unpopular at the present day, that many surgeons have scarcely witnessed it: they are, therefore, generally ignorant of the fact, that the application of the iron at a clear white heat is productive of little pain, and almost no inflammation; but that when the temperature is less considerable, much pain and irritation are immediately produced, followed in many cases by severe inflammation.

An iron, small enough to enter the socket of a tooth, will inevitably lose much of its heat between the fire and the mouth. An additional portion will be dissipated by the moisture of the part before it can act upon the solids; while the steam resulting from the application, together with the radiant heat of the iron, must necessarily stimulate the neighbouring surface, in defiance of every precaution. The evident exacerbation of symptoms produced by the cautery in Mr W.'s case, resulted, no doubt, from all these causes combined, and should caution us against depending too much upon it in such affections.

The phenomenon which presented itself after the final application of the iron, (I allude to the escape of blood from the uninjured gum) clearly demonstrated that a wound of any kind is not in all instances necessary to the production of this disease. One of the cases mentioned in the editorial notes upon the paper of Dr Humphrey, goes to establish the same fact, and appears to prove that some affinity exists between this complaint and purpura hemorrhagica.

The case is extracted from a communication by Dr Elssaesser, published in Hufeland's Journal, for Feb. 1824. The patient was constantly subject, from the time of dentition, to numerous subcutaneous extravasations of blood, forming maculæ, from the eighth of an inch to an inch in diameter, which disappeared in five or six days, after undergoing the usual changes of colour, giving place to fresh eruptions in other spots. This patient fell a victim, in childhood, to a hemorrhage caused by a slight wound on the head. His two brothers evinced the same strange idiosyncracy.

It does not appear that any of the cases to which I have alluded have been attended with hemorrhage from considerable arteries; on the contrary, the blood seems to ooze from the capillaries alone. Among the descendants of Mrs Smith, the discharge generally commenced several days after the injury, at a time when the wound was

partially healed. In the sickle cut which Mr W. received, I have reason to believe, judging from his own description of the symptoms, that no unusual amount of arterial bleeding occurred; and in Dr Elssaesser's case, death was occasioned by the accidental removal of a scab from a very slight cut, situated on the patient's head.

From these facts, it would appear, that this peculiar flux, even when occasioned by a wound, has nothing in common with simple traumatic hemorrhage. It is, therefore, less surprising, that the ingenious contrivance suggested by Dr Physick, was not productive of the same benefit in this case, which had resulted in those wherein he had previously employed it. The permanent extension of the cheeks and the action of the air, stimulated the salivary glands, and increased the activity of the circulation in the neighbourhood of the injured part. The coagulation of the blood on its exit, by means of the spunk, was of no avail. Indeed, whenever the wound was left undisturbed for any considerable time, the whole surface would be found covered with a dense coagulum, but this did not lessen, in any degree, the rapidity of the discharge.

I would not, however, be understood to say, that the prevention of suction was unimportant in the case of Mr W. On the contrary, I think it highly probable, that the disease proved less obstinate, in consequence of the slight separation of the incisors, which was kept up by the cork, introduced between them. Over this the lips were closed; involuntary suction was prevented, and the salivary glands and fauces were not stimulated to undue action. But the successful termination of this formidable affection is, I think, mainly referrible to *the timely adoption of an invigorating plan of treatment, and the free employment of the tincture of opium.* Indeed I am convinced, that had all stimulant and local treatment been omitted on the 27th of December, the case would have terminated more speedily.

Since the preceding pages were written, I have met with several other notices of hereditary hemorrhage, in which are contained facts interesting in themselves, and illustrative of the observations contained in the present communication.

An essay by Dr John Hay, of Reading, (Mass.) published in the N. E. Journal, vol. ii. p. 221, gives a very full account of this idiosyncracy, as it occurred in Mr Oliver Appleton of Ipswich and his male descendants through many generations. One of this gentle-

man's relations married a Mrs Smith, of Haverhill, supposed to be the lady alluded to in Dr Otto's first paper on this subject.

As many of the sufferers were members of the medical profession, there is every reason to suppose, that all the resources of the art were properly tested; but it does not appear that any check was opposed to its fatal career, until the trial of the sulphate of soda.

Cases are mentioned of bleeding from almost every species of slight injury; but the most important facts are as follows:

The predisposition does not display itself in every generation, but descends through the grandsons in the female line. "The bleeders" are all of a light complexion, apparently healthy, and of a choleric disposition. The hemorrhage seldom appears for several days after the wound, *never flows per saltum*, and is sometimes accompanied by considerable pain. A wound is not in all instances necessary to the discharge; for death has occurred from epistaxis, and hæmoptisis; and in one instance, two quarts of blood flowed from the integuments of the hand, after a slight bruise which did not abrade the skin. When ligatures have been applied above a wound, to arrest the discharge, it has burst forth again, *from above the ligature*, attended with much pain.

Dr Hay mentions, that, during the discharge, the "bleeders" are very much troubled with costiveness and vomiting. He states that the *sulphate of soda*, given in the dose of an ounce, and repeated daily for several days, generally proves successful; but that when employed "more frequently," it never fails: he mentions, however, but one case in which it was attended with advantage.

Drs Wm and Saml Buel, have published in the *N. Y. Physico-Med. Journal*, vol. i. an account of a similar family predisposition in the descendants of the Rev. Timothy Collins, the first pastor of the town of Litchfield, Conn. His son was the first who displayed it, and it afterwards affected some of the branches of the family in every generation, confining its attacks to the males. One of the fatal cases resulted from the extraction of a tooth. The hemorrhage *never flowed per saltum*, and the blood always coagulated freely. Those who were affected were of sallow complexion, and subject to plethora and spontaneous hemorrhage from the nose and mouth. *No mechanical or styptic treatment was productive of any benefit.* Pressure usually "distended the part above, rendering it livid and intolerably painful; nor could relief be obtained until the discharge was permitted to continue."

Dr ELSSAESSER's papers* contain several interesting cases; but it is unnecessary to present them to the reader, after what has been already narrated. Two of the individuals affected were sisters; and these, with one other, are the only exceptions that I have met with to the general rule that confines the disease to males. These females were subject to spontaneous hemorrhage in early life.

Dr E. has also communicated a *post mortem examination*, of one of his cases. The body was found "*bleached*" in almost every part. The heart and large vessels discharged a thin and slightly reddish serum. There was a marked deficiency of secretion in the serous cavities. Many glands in the mesentery, and several in front of the lower part of the trachea were enlarged. The cardiac half of the stomach "was uniformly pale red." The upper portions of the small intestine were pale, but, from the commencement of the ilium to the anus, the canal was reddened; the depth of tint increasing as it descended. This portion contained mucus, slightly coloured in the ilium, but mixed with florid blood in the rectum. The case commenced with hemorrhage from a slight wound, and terminated by discharges of blood from the rectum.

Professor NASSE, of Bonn, has published an elaborate paper on this subject†. The original I have not seen, and the slight notice of it contained in the N. E. Journal, furnishes no additional information.

I might refer to many other isolated cases of this disease, and also to a few more instances of family predisposition to it‡, but it is time to close this paper, with a few practical remarks.

Hereditary hemorrhage is a disorder so rare, that very few have enjoyed the opportunity of witnessing a sufficient number of cases, to warrant them in adopting general views of its pathology; and, unfortunately, the recorded facts are not so numerous as to supply the deficiency. It must be left for others, at some future time, to detail with accuracy the morbid appearances, and peculiarities of temperament, which characterize the "bleeders." Setting aside all speculation, I shall content myself with offering a few comments upon the

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* HUFELAND's Journal, February and September, 1824.

† HORN's Archives, May and June, 1820.

‡ Vide Ed. Med. and Surg. Journal, vol. iv. p. 513, and N. E. Journal, vol. vi. p. 235.

preceding cases, and some practical conclusions deduced from their history.

All the evidence before us tends to show, that no great aberration from the customary state of health is necessary to produce this hemorrhage in the "bleeders." In many instances, no wound or obvious lesion of any part is necessary to the attack. The blood vessels appear to be at all times ready to pour out their contents upon the slightest excitement. The family at Ipswich were robust and choleric, characteristics very consistent with an undue degree of plethora and activity of the circulation. The "bleeders" of Litchfield were sallow and less vigorous; but were constantly liable to attacks of plethora and local determinations of blood, which were generally relieved by epistaxis, or other hemorrhages.

The state of the circulation in the case of Mr W. is very peculiar. His cheeks are generally red, and the other parts of his face pale; but his colour constantly varies with the play of his feelings. His pulse ordinarily beats with an active stroke, and there are commonly about eighty-five pulsations in the minute. When he is engaged in earnest conversation, its rapidity is considerably increased; and I have known it to rise from eighty-two to ninety-five, from the exertion of walking across the floor.

In the worst forms of this idiosyncracy, in Dr Elssaesser's case for example, irritations, too slight to be discovered, are sufficient to produce extravasation*. Where the disposition is less marked, a local congestion, as in some of the Litchfield cases, or a bruise which does not abrade the skin, as in one of Dr Hay's cases, may suffice; but more commonly a wound is required to call the disease into action.

It is obvious, however, that few of the "bleeders" would arrive at years of discretion, in the midst of so many dangers, if they were at all times equally liable to hemorrhage. It will be remembered that Mr W. once received a severe wound, which was productive of no serious consequences. It is, therefore, a matter of considerable importance to guard those who are subject to this disease against all causes of plethora, and among these, suppression or diminution of the natural secretions, is the most powerful.

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* See a case of bloody sweat in a young girl. By Mesaporitus, Phil. Trans. Abr. vol. v.

Dr Hay particularly mentions that his cases were affected with great costiveness and irritability of stomach, *during the time of the discharge.* Such a condition of the bowels could hardly fail to increase the liability to hemorrhage in persons so constituted, and also to render it more obstinate when it occurs, by closing the most important *flood-gate* of the circulatory apparatus, if I may be allowed to employ such a simile.

The condition of the hepatic secretion is also of the highest importance upon the same principle.

In the fall of the year 1824, I attended a woman, who had laboured under jaundice for two years. She was attacked by rheumatism, for the relief of which I performed acupuncture in front of the arm, over the middle of the radius. Blood flowed from the orifice formed by the needle, when not restrained by a compress, and continued to do so, until the time of her death, which happened three days afterwards.

While the present paper was in preparation, Dr Condie had the politeness to furnish me with some notes of a somewhat similar case which occurred in his practice in 1827. The patient O'M. had been affected with jaundice for some time, and every part of his skin was of a deep yellow tint, inclining to green. He had been intemperate for some years. Dr C. was called to see him on the 23d of June, and found him affected with much derangement of the stomach, costiveness, loss of appetite, and other symptoms of hepatic disease, all which, excepting the colour of the skin, subsided considerably by the 5th of August, under the usual treatment. On the 7th he complained of burning and tickling of the gums with a slight discharge of blood from them. The hemorrhage increased, and by the next morning became very considerable, although there was *neither wound nor alteration of structure* in the part. It yielded readily to a combination of opium, ipecacuanha, and acetate of lead. On the 9th, the discharge returned and flowed from the mouth in a stream. It coagulated beneath the tongue, the coagula forming complete casts of that part of the mouth. When the gums were wiped with a sponge, *the blood was seen to start up at every pore* from the whole surface. The opium, ipecacuanha, and acetate of lead were continued, and cold water was held constantly in the mouth; and when the patient became extremely exhausted, wine and water were administered. By these means, the hemorrhage was checked, but a severe diarrhœa having supervened, death took

place on the 10th. The examination of the body was not permitted.

Deductions.

Depletion seems to be imperiously demanded in the first onset of this disease, whenever there exist any marks of general plethora, but with regard to the choice of the means considerable caution is required.

Venesection is hardly admissible; for cases are not wanting, in which the incision made by the lancet has formed a new centre for the hemorrhagic action*.

Purgatives are decidedly proper, even in the last stages of the complaint where there is any tendency to costiveness; for, by such means, we establish a natural flow of secretions, the suppression of which cannot fail to be injurious.

Calomel may be indicated, where there is deficient or morbid action of the liver; but in employing this article we should be careful to recollect, that ptyalism is very readily induced in patients who have lost a large amount of blood; and such an accident could not fail to induce unpleasant consequences in this disease.

Sulphate of soda, which is said to have had a specific effect in hereditary hemorrhage, certainly deserves especial attention, as the only successful remedial measure heretofore communicated to the public; but I should be more willing to place its effect in the *Ipswich cases* to the credit of its purging properties, than to any peculiar power that it can possess.

Tonic Remedies are indispensable at the close of the disease, when extreme exhaustion is induced by the discharge; but those only which appertain to the class of dietetics are unexceptionable.

Direct Stimulants are altogether inadmissible.

Narcotics are strongly indicated, as exercising a powerful influence over irritation; and in those cases occasioned by a wound, they are all important, in consequence of the inefficacy of local treatment. They should be administered liberally.

Local Measures are generally unavailing, with one only exception.

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* See the case already cited in Phil. Trans. vol. v.

Astringents are invariably followed by an ultimate increase of the flux, though they may lessen it for a short period.

Pressure is productive of irritation and inflammation without suppressing the discharge, which, when denied an outlet, will produce either an internal extravasation, or a new hemorrhage from some other part of the body.

Cold was thought to produce some benefit in Dr CONDIE's case; but it was not applied alone, and the remedy was fully tested in the case of Mr W., but without advantage*.

The actual cautery has succeeded in many of the lighter cases; but it should never be persevered in, after it has been once properly applied without advantage.

Potential cautery has been employed in one mild case only, and in this case it was unsuccessful. From what I have seen of its effects in traumatic hemorrhage from small vessels, I should be inclined to view it favourably.

These deductions are not offered to the public as established facts. The ground is in great degree new, and the amount of experience small. My remarks are thrown out in the hope that some advantage may result from placing what is known more immediately before the profession, and from the proofs here given of the inefficacy of the usual plans of treatment. They must be subjected to the test of future observation.

ARTICLE III.—*Case of Epilepsy, successfully treated. By* JOHN C. OTTO, M. D. *One of the Physicians to the Pennsylvania Hospital.*

[Read before the Philadelphia College of Physicians, April 1, 1828.]

I was requested, in November 1821, to visit E. W., aged thirteen years, apparently of a good constitution, stout and of a healthy

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* Ice was applied to the gums during one night, but, unfortunately, no note of the fact was preserved.

aspect. His mother stated that he had been subject to convulsions a little more than a year. During the first month of the time, he had four or five, and they have been growing rather more frequent and violent ever since; nor does she know any cause to which to ascribe them. It was observable, from the beginning, that he would have several in pretty rapid succession, and then there would be a respite for a time. For the last three months, from the change to the full of the moon, he has had at least one a day on an average, and, from the full to the change, he has had none. Previous to an attack, his spirits are often unusually elevated for several hours; but he has no immediate warning of its occurrence. Any thing that vexes him much, or highly excites his mind, has frequently occasioned a convulsion. Sometimes even the slightest rebuke, or a refusal to indulge him in his capricious desires has brought it on, which has induced his parents to gratify him in every wish within their power, and frequently beyond what their limited means would justify. When affected, he falls down suddenly and is convulsed, and occasionally froths at the mouth, and his countenance becomes red and distorted: it sometimes lasts but five minutes, and at others half an hour. When prolonged, the convulsions cease for a minute or two and are then renewed, and are always followed by languor and headach. From the beginning, not merely his memory, but the other faculties of his mind appeared to suffer and to be gradually impaired. At first he took, under the direction of a physician, three or four purges, and then small quantities of calomel until his mouth became slightly sore, and a gentle salivation was kept up for a short time. He seemed a little better for this treatment, and it entirely freed him from a pain in the right side in the region of the liver. He took no other medicine, except what a person who called himself an Indian Doctor gave him, which consisted of about a tea-cupful of a root, put into three half pints of fourth proof rye whiskey: of this he took a tea-spoonful night and morning, and a table-spoonful whenever the family could perceive the convulsions were coming on. He became gradually worse during this treatment, his mind rapidly verging to fatuity, and after taking a large dose of the medicine, the symptoms of temporary mania were occasionally manifested. In one instance, he pursued his father with an axe with an intent to injure him, and it was necessary to tie or confine him several times. Upon inquiry, I have learned that his paternal grandmother and her sister have occasionally been deranged, and that their brother

has been so for forty years. Since last spring, he has passed about a dozen worms of the lumbricus species.

I ordered him some anthelmintic medicine, for worms occasionally aggravate and sometimes produce convulsions; and when a person is affected with epilepsy, and I have the least suspicion that they exist in the alimentary canal, I am in the habit of giving medicine for their expulsion, preparatory to a different treatment of this complaint. He was likewise to take three tea-spoonfuls of a mixture, consisting of equal parts in bulk of pulverized sage, ginger, and unbruised mustard seed; or by weight, according to the following formula:

℞.—Pulv. salviæ, gr. xvi.
Pulv. zingiberis, gr. xxx.
Sem. sinapi, gr. L.—M.

This quantity to be given, in water, syrup, or any more agreeable vehicle, three mornings fasting, and then omitted three mornings, and so on alternately. In most other instances, however, the medicine has been exhibited every day, either in the morning in a full dose, or, what I prefer, a tea-spoonful three times a day about an hour before eating. The dose is graduated by the age; grown persons take the spoon heaped full and young children proportionally. The sage should not be gathered longer than one season; the best Jamaica ginger is preferred, and the seeds have generally been the small black, but sometimes the white have been used.

3d December.—No worms have come from him, and he has had two slight fits since the previous visit.

22d December.—Had a slight attack on the evening of the 4th and another on the 8th when the moon was full; and on the 17th he had another from being irritated, which is the only one he has had for several months from the full to the change of the moon.

9th January 1822.—Has had five slight attacks, four before the full of the moon and one since. He was always lying when they occurred. They were unattended with convulsions, and were discovered by a frequent motion of the eyelids, otherwise he appeared as if asleep. They did not last more than five minutes, and always happened after being fatigued. His appetite has become more regular; he is more fleshy, and his mind has evidently improved, so much so that he is able to attend to some light work, which sometimes occupies his attention nearly the whole day. Upon this subject he is regulated by his feelings and strength which vary considerably, the object being to amuse and give him gentle employment. The day after Christmas he passed "a strange looking flat worm"

about nine inches long; for this is the description given of it. Supposing it might be part of a tapeworm, he was directed, in addition to the antispasmodic powder, which he has continued to use, to take early on those mornings he does not take the other medicine, a large tea-spoonful of the muriate of soda dissolved in water. It is calculated, when given in small quantities, to give tone to the stomach and bowels, to remove that state that is favourable to the production of the various kinds of worms that infest the alimentary canal, and in larger ones, to expel some of them when present. I employed it with great success in the Pennsylvania Hospital, in a case that was represented as having resisted elsewhere many of the most popular remedies for this complaint. As much was given early every morning as the stomach could readily bear without considerable nausea. In the course of the day, a great number of single joints was discharged, and occasionally pieces several inches long were removed. This plan was continued, with an occasional respite of a day, a little longer than any parts came away. I have known it to be equally beneficial in private practice.

11th February.—He persisted sufficiently in taking the muriate of soda, but no worm or pieces of one were discharged; has had four attacks since the last visit, one before the new moon and three since: they were all mild and lasted about eight or ten minutes, and he moved his body a little. His mother ascribes the recurrence of two of them to fatigue, which always produces an injurious effect on him, and to which many of the attacks are attributed. His mind seems to be completely restored, but his temper continues irritable. His strength is likewise so much improved that he works some days as well as he ever did, occupying himself in the business of a harness-maker in the shop of his father.

11th March.—Has had but three convulsions, and they were similar in violence and duration to those last reported.

22d April.—Has had three slight attacks, but they were milder than any heretofore. His mother thinks that an exposure to damp air renders him more irritable; but this state of mind is gradually subsiding. His strength improves, and he works without interruption.

7th August.—Had four convulsions during the first week in May, three of which were unusually severe; had then an interval of six weeks, afterwards a slight one in consequence of being frightened, and has since had another mild one. His temper continues to improve, and he is able to attend diligently to his work; but it is enjoined on him not to fatigue himself.

30th November.—Had no attack for rather more than three months before the 14th of October, since which time he has had three mild ones. His mother finding him so long well, discontinued, on the 6th of that month, the medicine, which he has been taking ever since my first attendance; but she again gave it on the return of the disease. When a paroxysm now comes on, he loses his strength, lies down, and stretches himself; but has not the least convulsion. In about ten minntes he rises and feels well, showing a very manifest alteration in the violence of the complaint.

30th June 1823 —Had two slight attacks about a week after the last report; took his medicine three weeks afterwards, and then laid it aside entirely. His temper has entirely lost its irritability, and his mind every trace of imbecility, and he works with diligence at his trade. This happy state lasted four years, when he went to the eastward to reside.

In this very afflicting and unmanageable disease, it is necessary to continue whatever medicine may be selected a long time; for a short period does not afford an opportunity of ascertaining its virtues. My plan has been to give the antispasmodic powder six months, and much longer if it appears to benefit. In this case it was used more than a year. I am sensible that it restores but few, but it has been more efficacious than any thing else I ever tried. Many cases that might have been relieved by an early use of this remedy, may probably continue afterwards from some organic affection, that places them beyond the power of medicine,—diseased function running into organic disorder. There are but few complaints that are cured after many years standing. In some instances, the disease has been much mitigated, although not removed, and much comfort has been obtained. I have succeeded with this prescription in some violent cases of Chorea St Viti; and in some painful affections of the head that appeared to depend on the state of the stomach, it has proved very beneficial. It acts as a gentle tonic, and sometimes as a very mild aperient, and is calculated to do good in a variety of affections that arise from the stomach and alimentary canal being deranged in their functions from want of tone.

There is one variety of epilepsy that I do not recollect having seen described by any author, which it will be proper to notice; for I consider it at least a grade of that disease. It consists in a momentary partial suspension of the faculties of the mind and the external senses, and is called in general, by the members of the family,

fits of absence, from the inability, at that time, to attend properly to any thing; and is entirely different from the inattention arising from being absorbed in deep thought, or the habit of abstraction to which some persons are liable. I have seen it only in children, and, no doubt, from the transient nature of its attacks, it existed some time in them before it was noticed and considered as a disease; the want of attention being ascribed at first to the heedlessness incident to that period of life, and, so short is the absent fit after it is detected, that a great length of time passes before it is observed by the different members of the family. When addressed they do not return an answer, even when they are not occupied in any thing, and when they are apparently attending to what is said. This partial suspension is momentary, remaining in general but a few seconds, and very rarely a minute. In a very few instances, it is farther prolonged, and then becomes very easily detected. During the time, the countenance loses its intelligence, and the eye its brilliancy, and the face, more especially about the mouth, becomes pallid, without the least convulsive motion in any of its muscles. A peculiarity of aspect immediately manifests it to any person accustomed to notice it. In the milder attacks, if the child is engaged in conversation, there is a momentary cessation, and it sometimes continues afterwards on the same subject, without being conscious of there having been any interruption in what it was saying; but most generally, after the absent fit it commences a new train of thought. If reciting a lesson it will recommence where it stopped, without being sensible of any breach of continuity; at other times, it has a confused idea of something unusual having occurred. Commonly the child is silent during the paroxysm, if this term may be used to express this affection; but occasionally there is a muttering, or repetition of some sound or word. If spoken to in a loud voice, it shows that it hears, and attempts some incoherent answer. If walking, the sight is not so much impaired, but that it will move around any obstacle in its way, or even step across a gutter. If engaged in writing, the fingers often continue their grasp of the pen, and a zig-zag line is formed; or, if sewing, the work is continued but done very badly, the stitches being very irregular. A child will even, during one of these absent fits, if eating, occasionally lift the cup to its mouth and swallow its contents, but more commonly they are spilled. When affected it sometimes hurries to its parents or others for assistance. These attacks are marked with different degrees of intensity, and the ex-

ternal and internal senses manifest it accordingly. The same case varies during its progress, in these respects, and different cases exhibit some diversity. In some instances, the person has remained months and even years before convulsions have ensued, to mark a more decided and acknowledged state of epilepsy. These cases are generally followed by convulsions, and mostly baffle every effort to give relief. Sometimes the absent fits have entirely ceased after the convulsions have continued a good while, and in others they have occurred during the whole course of the disease. Although I have seen this peculiar state only in children, I have no doubt, as epilepsy commences at every period of life, that this affection may take place at any time of our existence. It is proper to state, that this description has been drawn from a few cases only: a greater number would have enabled me to render it more complete.

ARTICLE IV.—*Observations on Vaccination; in a Letter addressed to the Committee of the Philadelphia Medical Society appointed to collect facts in relation to the recent occurrence of Small Pox in this city.* *By* JOHN REDMAN COXE, M.D., *Professor of Materia Medica and Pharmacy in the University of Pennsylvania, &c. &c.**

There is, perhaps, no individual in the United States—probably in the world, who has a more undoubted right to question the assertions made against vaccination, than one of the members of your committee†. He was himself, at the age of three weeks, one of the earliest of those subjected to its influence, now upwards of twenty-six years ago, and was, immediately afterwards, subjected to every

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* [We published some extracts from this interesting letter in our last number, as a part of the report of the Committee on small pox; but the whole is so highly important, and comes from a source so justly regarded on the subject of vaccination, that we conceived that we could not do a more acceptable service to the profession than by laying it before them entire. The author readily acceded to our wishes, and had the goodness to furnish us with a revised copy of the original communication with additions for our use.—*Ed.*]

† Dr EDWARD JENNER COXE.

possible means of variolous infection. Inoculated during a succession of years, probably at least fifty times by myself and subsequently repeated by his own hands, he was likewise exposed for a considerable time, and held in the arms of an individual in the most malignant state of small pox, not more than ten weeks after the termination of the vaccine. This, together with numerous other trials on the subject, made with every possible care and precaution, many of which are detailed in my treatise on vaccination, published in 1802, fully satisfied my mind, that the vaccine was entitled to every praise as a preservative against small pox, which had been ascribed to it by the illustrious JENNER. All of them triumphantly and fully substantiated the anti-variolous character of the vaccine; and I have not the slightest reason for believing, that any case that has thus come under my care, has been affected subsequently with what is termed the varioloid. The only solitary instance of any approximation thereto, was in a boy, about five years ago, whom I vaccinated in 1802, and who then had an eruption, said to be small pox, but which I had not an opportunity of seeing, until the decline of the disease. The attending circumstances, however, inclined me to believe it was the chicken pox; although, admitting it really to have been small pox, on referring to my minutes of the case, I find it stated to have been perfect, but particularly mentioned as having been much rubbed. Nevertheless, it probably may have been of the nature of small pox; for it appears from the same minutes, that in ten weeks from vaccination he had urticaria, and in two weeks from that period, chicken pox, which was communicated to his nurse, who had had the small pox in early life. I am not now, nor was I at that time, at all disposed to question the efficacy of vaccination from this case. Its having been much rubbed is probably an adequate reason for presuming it had not sufficiently guarded the system, and I did not test this case by variolous inoculation.

In referring to my minutes, which I kept during the whole progress of my experimental researches into the character of the vaccine, with the most scrupulous exactitude, and *daily* reported *every* individual case that came under my care, I find I have uniformly noted the term *perfect*, at the end of each case, with which I was satisfied, and that of *doubtful*, where any circumstances gave the disease a suspicious character; so that I can now advert to every case I had for the first three or four years, with the certainty of finding

every particular attending on each. After that period, I was less attentive in this respect; but I was minutely attentive to seeing my patients, *at least every other day*, during the *whole progress* of the disease. Few, I believe, can say the same, and fewer still can point to *any certain record of the real character* of the disease, which may be noted in their daybooks as the vaccine! This can be adduced at this distant date, only in proof of the insertion of the matter: of the future progress of the infection, little can be known. Memory is too treacherous to be regarded as evidence in a case of this description, by which the vaccine must be forced to forego its asserted prophylactic powers; and I would infinitely rather presume some absolute imperfection or failure of the process, than give up my firm conviction in its preservative tendency.

To evince that even at that early period of vaccination, I was strongly impressed with an apprehension of the dangers likely to ensue upon the inattentive manner in which the process of vaccination was too frequently pursued, owing to its mild and gentle character, I beg to quote the following extract from my treatise adverted to. It refers to the necessity of constant and daily attention to the disease throughout its course, and the want of which is, I firmly believe, one principal cause of the present uncertainty we labour under respecting it. "Enough is said, however, I trust, to point out the necessity of strict attention, in order to prevent our being imposed on by the *spurious* for the *genuine* disease; an error, which, by the false confidence impressed, has unfortunately been productive of consequences fatal to the patient, and of injury to the extension of this most valuable blessing. That this is not a false dread, must be very evident to the inhabitants of such places, into which the spurious disease has been unfortunately communicated. *Even here*, where the knowledge of the disease has been more extended, and is more easily acquired, it has been insufficient to prevent the occasional appearance of this insidious enemy, which has not failed to check the favourable impression of the disease which many had previously entertained."—Preface, p. 3.

That many mistakes occurred in the early period of vaccination, few will, I believe, doubt; and that they have been, and will continue to be, perhaps for years to come, a fertile source of the supposed or real cases of small pox after vaccination, have long been firmly established truths in my mind, and must prove to physicians the absolute necessity of paying much stricter attention to the disease,

than has, I fear, been usually done. The mildness of the vaccine has often been the occasion of physicians neglecting to see their patients regularly; by which means, circumstances have been overlooked, that might have produced some degree of doubt as to the perfection of the disease they had excited, during that period, in which its regular progress ought to have been sedulously watched and carefully noted down; so that memory might not be charged with a recollection of events long passed by, and which may be deemed to be impossible, even in a person possessed of this faculty in the most tenacious degree. A physician, for instance, sees a small and apparently perfect vesicle following the insertion of the virus, on the fourth or fifth day. Satisfied in his own mind, he, perhaps, omits his visits for several successive days, during which interval, an accidental injury may have completely changed the character of the disease. He finds a creeping sore, with an irregular scab progressing, in place of the perfect and beautiful vesicle he had anticipated. From its former appearance, however, he persuades himself that the disease has produced its perfect effect upon the system, and pronounces his patient free from any danger from variolous infection. But in this early stage at which an accident may occur, how can he be certain that the disease, then *merely local*, may not have completely lost its peculiar property, and become a sore entirely different from the perfect pock that runs its regular course! Such cases I have seen, and such I have always regarded as at best *doubtful*, and in whom the after occurrence of small pox would not by any means surprise me.

That each case of the disease, however perfect and regular in its progress, may not *invariably* prove a preservative to the system, will be readily granted, if the disease does not affect the system constitutionally; or, in other words, if it should be merely a *local* affection. There can be no reasonable doubt, that such may occasionally be the case; and it is, perhaps, as yet a defect in vaccination, that we have no absolute and unqualified test, in *every instance*, to ascertain the constitutionality of the disease. This, however, derogates in no degree from the value of vaccination, but merely proves our imperfection as to all its particulars. The best test, so far as my experience warrants me to state it, is the one recommended by Mr Bryce, that of re-vaccinating about the sixth day. In this case, if the re-vaccination succeeds, it progresses with equal rapidity and with a character as strongly marked, although inferior in size,

as that of the original vesicle, provided the system has been pervaded by its influence.

However this may be, there is sometimes the same uncertainty in the small pox itself. One superiority, nevertheless, the vaccine possesses; viz. that no other disease can be mistaken for it. It possesses a character not to be mistaken; whereas the chicken pox and measles, &c. have at times been mistaken for the small pox, or the reverse*. Neither have we a modified vaccine, as far as I know; accident may destroy it, but no other disease seems to assimilate with it, and derange its appearance, to the danger of its being mistaken. It may vary as to colour, being sometimes quite blue as indigo, and the appearance of the lymph is sometimes clouded; but the general aspect of the vesicle is so peculiar, as scarcely, except from accident or absolute ignorance, to be mistaken. A person acquainted with the character of the vaccine can only be mistaken in it from accidental injury; for it differs, toto cœlo, from every other known eruption.

At the hazard of encroaching on your time, I shall cursorily mention a case of genuine vaccine followed by small pox, which, if not explicable on the above supposition of its being merely local, may yet be explained on the ground of its being one of those few cases, which might have been liable to a second attack of small pox. Nor is it more extraordinary, that an *occasional* instance should occur of small pox *after* vaccination, than that now and then a case of vaccine should take place after perfect small pox, of which I have known and recorded about a dozen instances.

—— G. was vaccinated by Dr —— March 31st, 1803. The vesicle went regularly through its course *without inducing any indisposition.* The areola was perfect on the 9th day, and the scab fell off on the 22d. On Thursday, three weeks from vaccination, viz. April 21st, the child was exposed to the small pox, in a patient having it very finely on the turn. On Friday, the 29th, the child became indisposed; this continued on Saturday and Sunday, when a scarlet efflorescence appeared over the body, and, on Monday night, the child had two convulsion fits. On Tuesday, several pock appeared over the body and face, continuing to come out for three

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* Many of the old writers on small pox have described several varieties, as they deem them, under the names of horn pock, wind pock, and water pock; and MORTON speaks of the chicken pock as a species of the disease.

days: about twenty filled and maturated. The face became tumid, and the eruptive fever disappeared. The child had had the chicken pox during the winter. I did not myself see this case, but have no doubt of the accuracy of the information.

During our Lectures of 1825–6, I was called to attend Mr Sawyer, a student, son of Dr S. of North Carolina. Had he not assured me he had been vaccinated in early life by his father, I should have at once affirmed he was about to have the small pox. This satisfied my mind, but he nevertheless had the disease in high perfection; not a modified case, but the real old-fashioned disease. Of the preceding vaccine, I know nothing.

Twenty-six years have just elapsed, since I first succeeded in introducing the vaccine disease into Philadelphia. A new generation has within that period sprung up, who owe their safety from the small pox to the former disease. If we suppose the population of Philadelphia to amount only to 120,000, we shall probably not err, in stating the vaccinated portion at one-half. We have had, in the period named, the small pox several times amongst us; but, although the inoculation for that disease has been long suspended, except as a test after the vaccine, we have never seen it spread amongst that immense number, who have been vaccinated! Is it possible to imagine that one-half of a city, like Philadelphia, could have so entirely escaped the ravages of an epidemic, if they had not securely opposed the egis of JENNER to that loathsome and dangerous disease? Where are now the numerous vestiges of its frightful ravages? It is now as *rare* to see a person disfigured from the small pox, as it was *common* formerly. If some have taken what has been called the varioloid, what a small proportion do they bear to those who have escaped. Of those who thus have taken it, I must require accurate proof, from written notes taken at the time, that the vaccine had *really* been taken, and that it had regularly passed through all its stages. But where are these proofs? What documents can our physicians generally produce of such high and obvious importance? Will they appeal to memory. This is too treacherous to command belief in matters of distant date, and especially as vaccination has been too frequently pursued. For my own part, I have little doubt, that by far the greater number of those, who have had the so called *varioloid*, *modified* small pox—or by whatever other name it may be called,—actually laboured under the *genuine* disease, from vaccination imperfectly performed, or gone through.

It will, I think, be found that the description of varioloid is very similar to that of many of the cases of small pox, as laid down by the old writers on the subject; and more particularly of some of those anomalous ones, which were apparent in almost every epidemic described. It is well to remember, that few physicians, now living, have ever witnessed such an epidemic; and our knowledge must consequently be derived from a close comparison of our so called cases of varioloid, with the accounts handed down to us by those who have witnessed small pox, in every shape and feature. Let such a comparison be strictly instituted between the accounts left us by SYDENHAM, MORTON, and writers even preceding them, and those of *varioloid* and *modified* small pox of the present period, and a strong analogy will be found to exist between them. I shall be glad, myself, to know what peculiar symptom now occurs, that may be regarded as absolutely diagnostic of these so named disorders.

It is time for physicians carefully to attend to vaccination throughout *its whole* career, and minute down each case; if they desire fully to comprehend the character and progress of any future disease, which they may designate by terms that appear to me unfounded. This is a duty they owe to themselves and to the public; and would be a great relief to that state of uncertainty, under which the mind now labours. For myself, I can only say, that no circumstance has yet tended to diminish my firm belief in the efficacy of vaccination, when faithfully and accurately performed, and duly attended throughout its full career.

I think it might be well to establish by law, that every physician, who vaccinated a patient, should keep an accurate record of the case, and minute down each day's appearance of the disease. It may be said that this would be too troublesome and laborious for the physician in full practice. It is nevertheless, I think, an imperative duty; and would at all times be a sure reference, in case of future alarm as to varioloid, &c. If the labour is deemed too great, let the business be committed to a few, who will undertake thus to record their practice in this disease; and let it be the duty also of the physician, at the close of the disease, to deliver to the patient or his friends, a faithful transcript of his daily remarks; so that, in case of the death of the former, no uncertainty may remain as to his sentiments at the time, whereby to establish the real character of any future eruptive complaint that may overtake the patient.

I will only further remark, that however proper it may be to enact

a law prohibiting inoculation *in the first instance;* it is altogether unnecessary, if not absolutely incorrect, to prevent physicians from testing their patients by it, subsequently. Either the vaccine is, or is not, the preservative it is affirmed to be. If it is, what hazard can attend this subsequent trial? If it is not, we ought as speedily as possible to renew the system of inoculation, as inferior in danger to the natural disease.

ARTICLE V.—*Observations on the Employment of the Catheter or Sound for arresting Hemorrhage from the Urethra; with Remarks on the probable Modus Operandi of the Instrument.* *By* WILLIAM DARRACH, M. D.

[With a Plate.]

The case of severe hæmaturia, noticed in the Medico-Chirurgical Review, (vol. xi. No. 29, p. 145—6), in which a sound was employed by Dr CHASTAINGT to arrest the hemorrhage, reminded me of a case of profuse hemorrhage from the urethra after lithotomy, in which the same means were successfully employed.

An individual, who had been afflicted for some years with symptoms of the stone, applied to Dr PHYSICK in the fall of 1817, and underwent the operation of lithotomy. Considerable difficulty was experienced in passing the sound and finding the stone. The hemorrhage from the transverse perineal artery was unusually great; its calibre being equal to that of the pudic of ordinary size, and requiring to be secured by a ligature. The stone, which was large, was found partially incysted in the anterior portion of the bladder, a little above its neck. The patient was put to bed in the morning and passed the rest of the day comfortably. The next morning, however, a profuse hemorrhage occurred, *the discharge of blood proceeding wholly from the urethra, and not in the least from the wound.* Dr PHYSICK, having arrived, requested a catheter of the largest size, and, instantly passing it into the bladder by the urethra, had the satisfaction to find the alarming hemorrhage permanently arrested.

Though Dr CHASTAINGT introduced the sound with other intentions than to arrest hemorrhage, and though happy accident favour-

ed him with an *unexpected* cure; yet the profession will not be the less pleased to receive his case, in proof of the excellence of an *apparently new* practice. The instruments employed by Dr CHASTAINGT and Dr PHYSICK were different; the one a sound, the other an elastic gum catheter. The complaints nosologically considered were also different, the one hæmaturia, the other consecutive hemorrhage from lithotomy; yet in essential points, there was no difference between the two cases. In both, a sudden, profuse, and alarming hemorrhage occurred from the urethra, and was arrested by the introduction of a large urethral instrument.

Remarks.—Under this head, we shall inquire what was the seat of the hemorrhage in these cases, and what the modus operandi of the catheter and sound.

The review, above quoted, states, that Dr C., after having submitted the case of his patient to the physicians and surgeons of Paris, determined to examine the state of the bladder himself. Accordingly he introduced a sound, which met with some resistance at the neck of the bladder. This being overcome, the cavity of the organ was explored, but nothing could be detected. Dr C. now imagined that the resistance to the sound might have been caused by *varicose veins*, which probably were the seat of the hemorrhage. He, therefore, allowed the sound to remain in the bladder to exert a *salutary pressure* on the supposed dilated vessels. After this operation, the patient made water unmixed with blood.

Dr PHYSICK's case also presents matter for conjecture. It may be asked, what furnished the blood? In stone cases, secondary hemorrhage takes place generally from the wound, and proceeds from the superficial perineal, transverse perineal, inferior and internal hemorroidal, or pudic artery, or several of these vessels at the same time. But is there a case on record, besides the above, in which secondary hemorrhage happened *exclusively* from the urethra? What is the source of the hemorrhage in this case? If it be the divided surfaces of the prostate, rendered morbidly vascular by an irritating paroxysm of stone, why was there no hemorrhage by the wound? If it be fungus, or vascular flocculency of the mucous coat of the bladder, or enlarged and ruptured vessels of that portion of the surface of the viscus, where the stone adhered, why did the blood flow exclusively from the urethra? And finally, how are we to explain the fact, that the passage of a catheter should have so *quickly* and *effectually* arrested the hemorrhage?

None of the places above enumerated could have been the seat of the hemorrhage in this case. We are disposed to think, that its seat must have been in the *congested veins* of the urethra; and surgical and anatomical knowledge will be found to support the conjecture.

PELLETAN (tom. ii. p. 283,) remarks that a varicose state of the veins at the neck of the bladder is a very common occurrence in *stone* patients, particularly if aged.

BOYER (tom. ix. p. 95,) enumerates, among the causes of hemorrhage from the urethra, varicose dilatations of the vessels at the neck of the bladder which become ruptured; and adds, that, as this hemorrhage is sometimes preceded by suppression of hemorrhoids, some have imagined that this suppression produced a particular determination of blood to the vessels at the neck of the bladder, causing, what they have been pleased to call, hemorrhoids of the bladder.

CHOPART, in autopsic examinations, has seen the vessels of the bladder varicose, and very tortuous under the mucous coat.

MORGAGNI has observed the same. BONET (Sepulc. vol. iii.) describes a case of discharge of blood from the urethra, in which a *redness remained* after death about the neck of the bladder.

DESAULT (vol. iii. p. 39,) is yet more to the point. We prefer to give his observation in his own words, as it shows that the method so successfully employed by Drs PHYSICK and CHASTAINGT, and original with them, was long before practised by him. He says, "Persons who reside any length of time in hot climates are particularly liable to be affected with bloody urine, having its seat in the *varicose vessels of the urethra* and neck of the bladder. I have treated and cured this complaint in several soldiers, returned from the East Indies, by means of the *elastic catheter**.

The commonly received anatomical views of the urethra and bladder do not explain the phrase, *varicose vessels of the urethra*, used by DESAULT. We can understand the expression, varicose vessels of the neck of the bladder; but where are the varicose vessels of the *urethra* situated? The urethra consists of a delicate membrane, together with a structure called the *spongy body*, to distinguish it from

* "Les personnes qui habitent les pays chauds sont particulierement sujettes au pissement de sang, provenant *des vaisseaux variqueux de l'urétre* et du col de la vessie. Nous avons traité et guérié de cette maladie au moyen de *sonde elastique*, plusieurs soldats revenant des grandes Indes."

Fig. I.

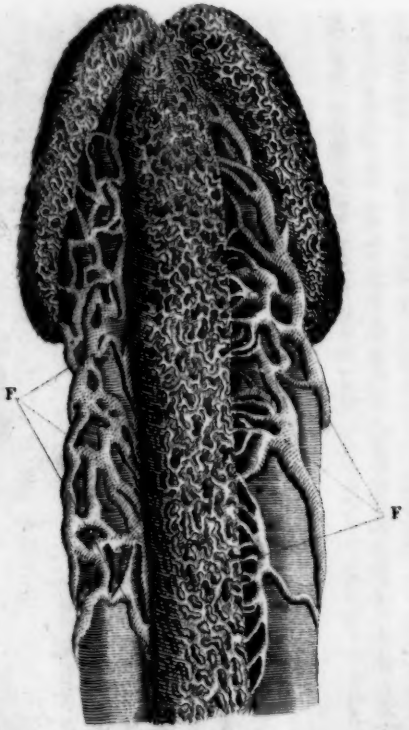

Fig. II.

the other portions of the penis, denominated *cavernous bodies*. No one thinks of making the delicate lining membrane of the urethra the seat of varicose vessels; nor will the commonly entertained idea of the intimate structure of the spongy body admit of the supposition that this is the seat of them. Between these two structures, which are united merely by cellular tissue, no distinct set of vessels has been discovered. Where then are we to find the varicose vessels of the urethra, spoken of by DESAULT, and are we to consider them as veins or arteries?

HUNTER and MASCAGNI's views of the corpus spongiosum urethræ afford a satisfactory answer to the above question. The *varicose vessels of the urethra* can be nothing else than *congested portions of the corpus spongiosum itself*.

The corpus spongiosum is a venous plexus, and is as much a *constituent part* of the venous system as the spinal plexus, or any other venous plexus of the body. It has been arbitrarily separated from this system, because it forms a distinct body, which, with three others, namely, the glans and two corpora cavernosa, compose the entire penis, and because this organ became an object of very attentive study and examination by anatomists, long before the entire venous system was made out or fully investigated. Now, the corpus spongiosum, or in other words, *urethral venous plexus*, communicates directly with a venous plexus situated on the corpora cavernosa; and this latter, by means of the vena azygos, with a venous plexus situated at the neck of the bladder externally. But MASCAGNI's description of the structure in question, with the assistance of the plate, which is taken from his "Prodromo," will present the subject more clearly.

Figure I.

FF "The trunks of veins branching from the deep seated dorsal vena azygos of the penis: which, traversing tortuously and with numerous anastomoses the corpora cavernosa, proceed laterally to the urethra, to penetrate *the compact venous plexus*, which composes the *corpus spongiosum* and the glans penis. These trunks unite with this venous plexus, and form together the intimate structure of the spongy body."

Figure II.

AA "The internal surface of the canal of the urethra, deprived of its lining membrane. It appears rough, and is covered with ridges and fissures of various dimensions, which are an assemblage

of *veins* variously interlacing each other, and having interposed their little accompanying arteries."

If, with MASCAGNI, we regard the structure outside the delicate urethral membrane, to be a *tissue of contorted venous tubes*, each of which is liable to temporary morbid dilatation, or permanent varix, as venous tubes elsewhere in the living body; it will not be difficult to understand how congestion may exist here, and consequent rupture take place, when circumstances, attendant upon the existence of stone in the bladder and its extraction, cause an undue determination of blood to the genital system.

Nor will it be difficult to explain the modus operandi of a large sized catheter or sound, in arresting a hemorrhage from the spongy body, on the supposition that it is a *venous plexus* in a *congested* state. The lining membrane of the urethra is very dilatable: the strongest evidence on this point has of late been furnished by the Lock Hospital practice in strictures, and by the operations of CIVIALE. The instrument, used in case of hemorrhage, stretches this membrane, so as to cause it to press against the spongy body, in other words, the venous plexus. This is pressed upon also by its external fibrous covering; and the consequence is, that the plexus becomes emptied of its blood, which, being forced into the deep seated communicating branches of the dorsal plexus, passes through these into the azygos, and finally into the vesical plexus. The source of the hemorrhage is thus stopped, and time is afforded for the emptied and ruptured vessels to heal, and the debilitated and enlarged exhalants to regain their tone.

ARTICLE VI.—*Observations on the Medical and Chemical Qualities of the Cornus Circinata, or Round-leaved Dogwood.* *By* JOSEPH H. ROBINSON, M.D., *of St Croix.*

The genus Cornus is distinguished by the following characters: Flowers, sometimes aggregated in a four-leaved involucrum. Calix, 4-toothed. Petals, 4, small, broader at the base. Drupe, inferior, not crowned by the calix. Nut, 2-celled, 2-seeded.—*Nuttall.*

The following are the species: 1. canadensis—2. florida—3. circinata—4. sericea—5. asperifolia—6. stricta—7. sanguinea—8. alba—9. paneculata—10. alternifolia. Of this genus there are also two other species in Europe and Asia, and two which are common to the old continent and America.

The circinata is designated in many parts of America, by the familiar appellations of *mountain willow, white rind, and round leaved dogwood.* Perhaps it may have derived its name from the shape of its leaves, (circinatus, rounded), as they are more oval than those belonging to the other species.

The circinata appears, from the above description, to be connected with a numerous kindred of plants, belonging to the class tetrandia, and order monogynia. It is not remarkable for its dimensions or beauty. It inhabits the sides of rivers; but is partial also to elevated and mountainous situations. Its localities are pretty numerous: it dreads, however, the coldest latitudes, as much as it dislikes the warmest. It may be found in many parts of that extensive tract of country, extending from Canada to Virginia. It is a shrub of eight or ten feet in height, and its foliage is not particularly thick. Its leaves are oval and broad, white and downy beneath, and waving at the edges. Its branches are rough and warty. About the middle of the year, it produces a small white flower, and berries of a blue colour. It is distinguished by Pursh in the following scientific language: "Ramis verrucosis, foliis lato-ovalibus, acuminatis, subtus albo tomentosis, cynus patentissimus."

The branches and stalks, when prepared for pulverization, have rather a quilled appearance, whitish internally, and possessing a dark epidermis. After the bark has been pulverized, it assumes a light yellow colour, has an aromatic flavour, and a pleasant, bitter, and astringent taste; although when first put into the mouth, it has the peculiar taste of colombo.

The circinata has not yet attracted much attention from the Faculty. It is mentioned in the pharmacopœia of the United States, as an inferior article; and is very cursorily noticed in some of our most valuable works on Materia Medica. From various circumstances, with which I have become acquainted, in connexion with the history of the plant, I am induced to believe that professors Monson and Ives, of New Haven, are entitled to the credit of having first introduced it into general practice. Recently, however, it

has been used by the learned editor of "Paris's Pharmacologia," and is mentioned by him in the most decided terms of approbation. Like some other medicinal agents, its properties were discovered by mere accident. The following interesting account of its discovery and early use is related by the worthy and much respected professor of Medicine in Yale College. "The Cornus circinata was formerly kept as a nostrum by a person from Canada, who used it with success in New Haven in 1795. A patient affected with a diseased liver was attacked with a diarrhœa, which it was not in the power of the physicians to check. At the request of the possessor of this nostrum, the physicians consented to give it a trial, and the diarrhœa was very much relieved by its use." "These facts," continues Dr Ives, "I had from Dr Æneas Monson. From the use of the remedy in this case, Dr Monson entertained a very high opinion of the article, and requested me to inquire for it. In 1803 I went several times upon the mountains, in quest of the plant. By an old man upon the mountains in Hamden (a place in the neighbourhood of New Haven) I was directed to the place, from whence it had been gathered by the empiric. I found the plant described in Willdenow, under the name of Cornus circinata. Its locality is on the Whenstone mountains on the north western aspect, among the broken rocks, and is found in this situation upon the east and west mountains in this place, (N. H.), locally associated with the Sambucus pubescens, and in abundance."

My own experience has not afforded a very extensive knowledge of the therapeutic character of the circinata. In my own case, however, such was the beneficial operation of the remedy, and so high is the opinion entertained by several eminent practitioners of its powers, that I shall never hesitate to employ it in all diseases of the bowels, attended with a weakened state of the mucous membrane.

Shortly after my arrival in America from the West Indies, I was seized with a violent and distressing diarrhœa, which, from the appearances of the evacuations, the state of my liver, and various other circumstances, I was induced to believe, proceeded from some derangement in the biliary apparatus. When the disease first made its appearance, I neglected all medical treatment; but after some time had elapsed, I was obliged to resort to an extensive use of cathartics, alteratives, and tonics. But they produced temporary alleviation only. In fact, the powers of the far famed colombo were never

found more inefficient. My mind now became a prey to despondency, and my spirits began to lose their natural elasticity. From the sudden attacks of the disease, I could never enjoy any necessary recreation, or find any satisfaction in the society of friends. In this dreadful situation, I consulted professor Ives, and was advised by him to try the circinata. I did so, and I am happy to state that the most satisfactory results attended its employment.

In other cases of a similar nature, the Doctor has used it with unvaried success. "In diarrhœa," he observes, "such as affects the sailors coming from the West and East Indies, it has exhibited itself superior to any other tonic and astringent, and is much less disposed to produce congestion than the Peruvian bark." The Doctor also gives his preference to this article in the diarrhœa attendant on pulmonary consumption, as well as in that which occurs in the latter stages of typhus, particularly in those cases which are liable to terminate in hemorrhage from the bowels.

This distinguished practitioner has derived considerable advantage from it, in the form of decoction, in chronic affections of the liver, accompanied with dyspepsia, when "thirst is present, and other liquids oppress."

In cholera infantum, the same gentleman has used it with decided benefit. He gives his testimony to the virtues of this remedy by observing, that "for a number of years he has used more of it than of the Peruvian bark."

In dysentery, after the proper preliminary steps have been pursued to lessen the inflammatory state of the bowels, and when the disease has assumed a chronic character, it will be found highly efficacious. In confirmation of this, we possess the pleasing assurances of Dr Ives of New-York. He remarks, with regard to its general exhibition in his practice, that "his experience in the use of this article has been sufficient to persuade him that it is a pleasant and powerful tonic, and that there are cases in which it is preferable to any other vegetable, belonging to the class of tonics."

Being under the conviction that it possesses highly tonic properties, and feeling satisfied that it can be retained more easily upon the stomach than the cinchona, I conceive that it may be used with much advantage, as a substitute, in the various forms of fever to which that heroic medicine may be suited. This remark is particularly applicable to the cases of children, for the reasons which I have assigned above.

In erysipelas, when marked by a feeble and typhoid state of the system, I have no doubt this bark will prove serviceable, especially in this country, as the disease frequently proceeds from the depraved habits of debauchees and drunkards. From these causes, the stomach is generally found extremely irritable; and as the circinata possesses a more aromatic flavour than the cinchona, I have no doubt it would be retained better, and produce less nausea.

But the circinata has not evinced remedial effects, merely when exhibited internally. Dr Ives of New Haven assures me, that he has used it "as an external application for gangrene, in preference to the Peruvian bark, and for ulcerated and spongy gums." In such cases, the Doctor adds, "it has in my hands succeeded better than any other article."

Through the friendly exertions of Mr Carpenter, a most intelligent druggist of this city, and a gentleman well known to the medical faculty from his interesting analyses of various substances, I have been enabled to obtain a knowledge of the constituent parts of the circinata. From his notes of the analysis, the following observations have been culled:

With *water*, the bark produces a deep red colour.

Proof spirit forms with it a beautiful tincture, and dissolves the largest portion of the active principles. It may consequently be considered as its best menstruum. The tincture furnishes, on evaporation, a dark red *extract*, which possesses, in a concentrated degree, all the bitterness and astringency of the bark.

To *alcohol* it imparts the same appearance as to water. The alcoholic solution, when concentrated by evaporation, is rendered milky by the addition of water, and a precipitate is formed. The *extract* digested in ether is partially dissolved, and the solution, on evaporation, furnishes a compound of resin, oil, and a small portion of a peculiar saline matter. This compound appears, from its sensible characters, to constitute the most active portion of the article.

In the action of reagents, the circinata affords a striking similarity to the cinchona. The *watery infusion* reddens tincture of litmus. Muriatic acid forms a yellow flaky precipitate with it. Acetate of lead in solution was quickly and copiously precipitated. A solution of tartar emetic was rendered turbid, and slowly precipitated. Sulphate of iron rendered it turbid, and immediately afterwards changed it to a bluish-black colour, and produced a very light precipitate. With lime-water a very copious precipitate was formed,

leaving the supernatant fluid almost colourless. Sulphuric, nitric, tartaric, prussic, and acetic acids were severally tried, but evinced no action on the infusion. The solution of ammonia caused no precipitate, but the infusion assumed a deeper red colour.

It will be perceived that the action of the above reagents is the same on the circinata and cinchona; but a difference is apparent, when the solution of galls or isinglass is used; the cinchona being copiously precipitated by either, whilst no change is produced on the infusion of the circinata.

From the above statement we may conclude, that the constituent proximate principles of the circinata are, tannin, gallic acid, resin, gum, mucilage, oil, and a peculiar saline matter, which differs from the salt discovered in the cornus florida, in possessing less bitterness, and more astringency.

From the examination of this substance, I am induced to believe that the extract will prove a valuable preparation. At present the bark is used in substance to the extent of one or two drachms, or in infusion and decoction, in ounce or two ounce doses. The infusion is prepared by adding half a pint of water to two drachms of the pulverized bark, or by pouring a pint of boiling water on one ounce of the bark coarsely powdered. The decoction is made by boiling one ounce of the bark in a pint of water. By professor Ives, the powdered bark has been employed in a composition, similar to the compound tincture of Peruvian bark, the circinata being used as a substitute for the cinchona. In obstinate diarrhœa, accompanied with dyspeptic symptoms and dry skin, Dr Ives of New York recommends a combination of one drachm of the bark with two or three grains of ipecacuanha, and given pro re nata. I have myself used one drachm of the powdered bark, mixed with two teaspoonfuls of the best Port wine. Externally, the circinata is used in fine powder.

Article VII.—*Kentish's Ointment recommended in the Treatment of Erysipelas.* *By* Charles D. Meigs, M.D.

Regarding the blood vessels of an inflamed part as in a state of diminished contractility, I suppose the best manner of curing inflammations, will be found to consist in restoring their contractility, so far as to bring it on an exact par with that of the contiguous or neighbouring healthy vessels. Sometimes we can effect this desirable object by very simple mechanical contrivances: a roller, a compress, position, &c., are in many instances the only things requisite to bring about this equilibrium. M. Brettoneau, of Tours, in France, cures even a bad scald in the course of a very few hours by a roller, which, acting as a substitute for the natural power of the capillary vessels, prevents not only their being dilated by the forcible injection *a tergo*, but also all the consequent phenomena of that sort of inflammation, called a scald or burn. Mr Baynton cures the most inveterate sore legs by strips of adhesive plaster and rollers, and every body knows how rapidly an œdematous limb may be brought back to a proper size and shape by a common roller judiciously applied. All these effects are dependent on the improved power of resistance, which they occasion in the weakened vessels of such parts.

It is quite clear that we can by mechanical means make an excellent substitute for the natural contractility of the small blood-vessels in superficial inflammation. Some persons say that this external pressure is the *true antiphlogistic.*

These plans are useful in procuring the resolution of inflammation. So, also, when we apply various washes, cold poultices, pledgets of vinegar and water, &c., we have it in view to promote the contraction and emptying of the vessels; for all those means occasion the parts to become whiter and paler, and the more so, as they are more efficacious, (i. e.) as they occasion the blood to be more completely excluded. But cold, lead water, &c. are not the only things that possess the power of increasing capillary contractility. Mr Kentish has shown, that in burns nothing possesses so much power in this way as his famous ointment, which for its excellent qualities in the cure of burns and scalds is known over the civilized world.

I have, for some few years past, employed the same ointment to

dress the erysipelatous inflammations that have fallen under my care; and I venture to affirm that I have found equal success from no other mode of treatment, though I have tried a great many.

There is a sort of erysipelas which affects children, and which has in not a few instances proved fatal. It is a most painful and unmanageable disease by the ordinary methods; yet I have seen it yield with the greatest rapidity, manifestly from the favourable action of KENTISH's ointment. I had a case not long since, in which a child had violent convulsions, in consequence of the constitutional irritation, produced by an erysipelas occupying the whole of its right foot, leg and thigh: the free application of the ointment removed the disease with the greatest readiness. I have treated a great many cases in this manner and have always found the application not only useful, but soothing and delightful to the patients. Instead of making extensive incisions, as some of the moderns have recommended, I would respectfully urge my professional brethren to make trial of this ointment, which is both easy to administer, and exceedingly comfortable to the patient.

I need not enlarge here on the similarity, I might say identity, of spontaneous erysipelas, and that occasioned by the application of heat. Both inflammations are cutaneous, diffuse, smarting, and disposed to vesicate. KENTISH's ointment is as useful in the one as in the other, and no disease yields more surely to any medicinal application than both of these do to the spirit of turpentine and basilicon mixture.

My method of employing it, is to render basilicon ointment soft (not fluid) with spirit of turpentine, and then to rub it on the part with the fingers. Let the anointing be repeated often enough to keep the part always very thinly covered.

This application does not interfere with any constitutional treatment, which may be demanded by circumstances. All such treatment is, however, unnecessary, in a majority of cases.

One of my patients has just recovered from a severe œdematous form of the disease in the leg, which has for years been affected with an ulcer, by the sole employment of the above mentioned ointment.

Analytical Reviews.

ARTICLE VIII.—*Pyrétologie Physiologique; ou Traité des Fièvres, considérées dans l'esprit de la Nouvelle Doctrine Médicale. Par* F. G. BOISSEAU, D.M. *&c. &c. 2-ième Edition. Paris*, 1824. *Nosographie Organique. Par* F. G. BOISSEAU, D.M. *&c. &c. Tome I. Paris*, 1823.

THE modern French medical doctrines are so often referred to, are so valuable, and, at the same time, so imperfectly known among us, that we have thought it would be a useful occupation of a portion of our pages, towards at least a large portion of our readers, to present an occasional sketch of some of their elementary parts. Of these, several have been occasionally taken up in our former numbers; but we have, as yet, offered no account of the prime subject of gastritis, as connected with fevers. Without something of this kind, to those who have not access to the French works, our inquiries must be incomplete; and we eagerly embrace the opportunity offered to us by the new volume of M. BOISSEAU. Together with the Pyrétologie of the same writer, it affords an excellent opportunity of exhibiting, so far as can be done in the crowded leaves of a review, the very points which we conceive are wanting.

The "Pyrétologie Physiologique" is an analysis of the nature of fevers, upon the principles, as apprehended by the author, of the physiological school of medicine. For this object, M. BOISSEAU has resolved to assume the ordinary definitions and descriptions of fevers, as commonly received by his countrymen, and bearing a considerable resemblance to those in use among us, which, as is well known, are mainly derived from the school of CULLEN. By so doing, he conceives, we think with justice, that he is greatly facilitating, and

rendering less repulsive, to the mind those modes of investigation and new facts, contributed for the improvement of science by M. Broussais, and various other labourers, many of whom have arisen under his auspices. To be furnished with an elaborate description and discussion of the characters and treatment of a variety of phlegmasiæ, principally of the primæ viæ, and to wind up by an attempt to demonstrate that "there is no such thing as fever," may be a correct synthetical process; but it requires such a sudden and revolting change of habits of thinking, that it is more likely to shock and discourage a practitioner, than to add to his amount of serviceable knowledge. On the other hand, prepared as at least so many of our countrymen are for the idea, that there exists, as we phrase it, "no idiopathic fever," we conceive the analytical order much more likely to prove useful. It is in vain to tell us, that "there is no such thing as a bilious fever;" we are, unfortunately, too well aware of the contrary: but if we are told, that "bilious fever" is entirely owing to inflammations of certain viscera, and that the knowledge of this fact will enable us materially to improve the treatment and our own success, we are immediately anxious to know why it is thought so, and are quite ready to peruse the necessary cases, dissections, and arguments.

Dr Boisseau has adopted the classification of professor Pinel, the arrangement exclusively in use in France, at the epocha when Dr Broussais's writings first appeared.

"It was time to connect with the great body of science, the researches which have been made within a few years relative to the seat and nature of fevers. A physician who wishes to describe the present real state of our knowledge on this subject, must take, for his starting point, the work of M. Pinel. Any other order than this, in place of diffusing clearness and light over the opinions of practitioners, and presenting a faithful guide to students, placed as they are between two contending systems, could produce no other effect than to confuse the ideas of the first, while it left the latter in a painful uncertainty, suffered them to fall into an unjust and inconsiderate contempt of one or other of the two doctrines, or what is still more dangerous, induced them to imagine that medicine has no fixed principles, and that it is nothing but a fluctuating product of the imagination."

"A new epocha," says our author, "has commenced in the science of medicine: yet our task is not to reconstruct the edifice of science, but to add to it, and renew, some of its parts which, from their antiquity, have tumbled into ruins."

The description of the state of medical parties and opinions in France, given to us in the preface to the Nosographie, is so interesting, that we will venture on an additional extract. Speaking of

the appearance of the doctrines of professor Broussais, Dr B. remarks:

"Until then the French physicians had generally lived in a species of harmony, somewhat rare among men of our profession; but, in 1816, they separated into several parties. Some, proud of having resisted the enthusiasm inspired by Pinel, remained faithful in their admiration of the past; others, superior to all personal feeling, adopted, with certain restrictions, the ideas of the day, which, in their eyes, were not possessed of the merit of unmixed novelty, and added them, without noise, to the mass of the ancient doctrines. Others again, in despite of a fixed resolution not to depart from the opinions of Brown and Pinel, suffer daily to escape some tacit confession which they hardly dare acknowledge to themselves; another and a numerous body adopt the new principles with enthusiasm, and, in frequent instances, permit exaggerated impressions to acquire the force of prejudices in their medical education; while some, in fine, content themselves with cultivating morbid anatomy, without appearing, in this, to seek for the support of any theory, being either unsettled in their selection of that one which they are to adopt, or willing to conceal, under an industrious research for facts, their adherence to some one which has lost or is losing the popular favour."

We deem it unnecessary to make much comment on the above opinions. We do think that there is a decided preference due to the "eclectic," progressive, or *additive* class which is enumerated in the second place; and to which M. Boisseau evidently wishes to attach himself. As every physician, however, is an independent agent, moral and philosophical, and must conscientiously act upon his own convictions of truth, we conceive that we do enough by laying our materials before the reader for his private judgment.

The Nosographie Organique is a description, in detail, of the diseases of the different organs of the body, considered separately; and constitutes a *synthetic* study of pathology. We have received the first volume only; which treats of the diseases of the alimentary canal, beginning at the mouth and concluding with the rectum. As we have determined, for reasons given above, to begin our notice with the analytical work, the regular consideration of the present will very probably run beyond the limits of a review; in which case, it is our intention to take it up in our next number. In the meanwhile, we may occasionally use it to illustrate points which may occur in the consideration of the Pyrétologie.

After a short introduction, in which he defines excitability, superexcitement or irritation, and subexcitement or asthenia, the author proceeds to a brief historical sketch; from which we shall borrow no more than we have already done, with the exception of the re-

mark that HIPPOCRATES, and the other authors under his name, are not to be held accountable for the modern classifications and definitions of fevers. The words πῦρ and πυρετὸς, so frequently employed by him, mean by no means the abstract conceptions which in later times have been attached to the words "a fever." They are merely used to express a symptom, viz. the *heat*, which is so remarkable over the patient's body. Thus πυρετὸς ξυνεχὴς, usually translated "synocha," or inflammatory fever, means nothing but "*continued heat.*" Bilious fever is not expressed in any single phrase in these writings; but the flow of bilious matter is specially mentioned where it occurs: neither do they define mucous or adynamic fevers. The word ἀταξία is used by HIPPOCRATES to express *irregularity* or confusion, and not, as M. PINEL has used it, after SELLE, to characterize, in an adjective form, the class of "ataxic fevers." Typhus, τύφος, merely means *stupor*, and τυφώδης πυρετὸς signifies a *heat with stupor*. Λοιμὸς, the plague, is equally ambiguous, and means, as various authors have shown, any terrible and destructive epidemic. It may easily be shown that subsequent writers were a long time before they began to attach ideas of nosological entities to these various expressions, which continued merely to express symptoms.

To proceed with our analysis, the first variety of fever which comes under our consideration is synocha, or "common inflammatory fever," as it is called. As our most generally diffused ideas on these subjects are obtained from CULLEN, DARWIN, and RUSH, we have thought it proper to note their opinions on the alleged local origin of this fever. By the first of these, all primary local disease is expressly excluded, in his very definition of the class of fevers. Dr DARWIN, on the contrary, states that "a strong, full pulse, with inflammation of the coats of the arteries, constitutes this disease. It originates from some topical inflammation; which, if the fever is not subdued, terminates in suppuration." (II. 1. 2. 1.) Dr RUSH, after defining this fever, adds, "these symptoms sometimes occur in the plague, the jail and yellow fever, and in the small pox; but they are the more common characteristics of pleurisy, gout, and rheumatism. They now and then occur in the influenza, the measles, and the puerperal fever." (Outlines. Class I. Art. 4.)

The necessary brevity of a review does not admit of our copying M. BOISSEAU's copious list of symptoms: they correspond tolerably well with our ideas on this subject. When local symptoms of

violence are superadded to the general character of pyrexia, the fever is considered, says M. B., as being *complicated* with some local irritative disease; as apoplexy, encephalitis, angina, pleurisy, &c. &c: and when an increase of severity occurs which is not ascribed to these causes, the fever is said to be *converted* into one of a gastric, adynamic, cerebral, ataxic, or other similarly diversified form. We are, by this arrangement, deprived of the information to be derived from morbid anatomy; as the disease either terminates in health, or is said to be complicated with or converted into, something of a different character. Dr J. P. Frank, however, has found the lining membrane of the arteries inflamed; from which the disease would appear, as considered by Dr Darwin, to consist chiefly in an arteritis. At the present day, according to Dr B., every one is agreed that the origin of this disease is an *excitement*, an *inflammation*, an *angiotenia*, &c. terms which amount to nearly the same meaning, and which describe an increase of vital action; the question still remaining open, in what part is this excitement situated. Many writers insist that it extends throughout the whole animal economy; others confine it to the whole sanguineous system, to the arteries, to the heart, to the great blood vessels, to the capillaries, &c. M. Broussais refers it to the mucous membranes, particularly those of the primæ viæ; M. Alard, to the subcutaneous cellular tissue.

Inflammatory fever, according to our author, may originate from inflammation of any part of the body; and, when the point of irritation is the eye, ear, larynx, pharynx, or any other part with whose inflammations we are more familiar, it loses the above name, and assumes that of ophthalmia, otitis, angina, &c. &c. In the greater number of cases, the origin of the disease is in some part of the alimentary canal, forming some one of the varieties of gastro-enteritis; while, in infancy, it is quite as frequently seated in the brain; and with females, in the uterus. At the period of puberty, it is most apt to be in the thorax; and with hard students, in the brain.

Various parts of the body are frequently affected at the same time; such as the skin, the cellular membrane, the muscles, the synovial membranes, &c.; nor does the author admit, as correct, the reasoning of M. Broussais, that, if this were the case, we should meet with the symptoms of erysipelas or some other cutaneous disease, of phlegmon, of rheumatism, or of gout. All these parts are capable, as has been demonstrated by that celebrated teacher with

regard to the stomach and bowels, of milder and more obscure grades of irritation than those described by the nosologists; and the heat, soreness, and tumefaction, which are occasionally met with in them, and the red flush of the skin, are abundant grounds for conceding to such irritations the inflammatory character.

As this local irritation manifests itself, in many instances, by obscure and slight signs, it is necessary for the practitioner to study, with great attention, both its remote and exciting causes, the idiosyncrasy of the patient, and the symptoms, in order to discern the real source of the disease, amid so many sympathetic and conflicting appearances. The importance of this is particularly enhanced by the reflection that it is only in this way that we can reasonably hope to prevent, by a well aimed and sufficiently energetic treatment, the *complication* or *conversion* of this *fever* with or into some of the more distinct, because more violent forms of local phlegmasia.

The principal difference, then, between this and the prevailing doctrine, is, that we are to study, with more care, the *mild* and *predisposing* states of local irritation; to suspect them sooner, and meet them with more promptitude, in order to prevent their sudden and dangerous growth. Instead of the fever *producing* phlegmasiæ, the phlegmasiæ already exist, and cause the fever; and it is our duty, as physicians, to find them out. In particular, it is necessary to be acquainted with the labours of Dr Broussais, in relation to the more moderate forms of inflammatory action in the primæ viæ.

The *treatment* consists of rest, diet, the abstraction of blood, emollients, and those derivatives which do not produce febrile irritation. A single bleeding is generally sufficient, unless the lungs are affected. Leeches should then be applied. If the abdomen be the seat of the primary irritation, they should be placed over the diseased part; except in dysenteric irritation, when they are most serviceable in the anus. The bleeding of the leech bites should be encouraged: if it become excessive, it should be checked by styptics, or, these failing, by cauterisation, either with a sharp-pointed piece of lunar caustic, a mineral acid, or the point of a red hot wire.

We are bound in conscience here to note the fact, that leeches are capable of destroying life. In addition to sufficient evidence to be drawn from books, the writer of this has himself been witness, in more than a single instance, to the fact. The best method of suppressing the hemorrhagy, is said to be, to dip a straw in oil of vitriol, and let a drop run into the bite.

The importance of diet, strongly recommended by HIPPOCRATES, and also by modern surgeons, has received a new elucidation from the labours of M. BROUSSAIS in gastro-enteric irritations. It should be combined with the use of mucilaginous diluents; both in these cases, and in irritations of the bladder. *If there be no gastro-enteric irritation*, nitre may be advantageously employed. Warm foot baths, emollient fomentations, cool spongings, &c. should be used with a physician's judgment, but more frequently than is generally the case among us. These remedies are extremely serviceable; although it is not uncommon to speak slightingly of them, as old women's remedies. We are very sure that if they be such, the old women will, in some cases, be more successful than the practitioner who confines himself to the more valiant remedies of the shop.

All contra-irritants, or revulsives, which produce fever, such as sinapisms and blisters, are forbidden; nor can even the milder ones be used with advantage, if the skin be highly excited. Tepid or cool spongings are all that should then be applied to this irritable organ.

Bilious Fever —Fièvre Gastrique is sometimes bilious and sometimes not. When its premonitory symptoms of the local kind are principally referrible to the stomach, the patient is affected with "embarras gastrique," which we will translate "foulness of the stomach;" if there be colic, borborygmata, costiveness, or a diarrhœa discharging bilious matters, it is an intestinal "embarras," or foulness; and these may be combined. If a chill occur, soon followed by high fever, thirst, anorexia, an increased bitterness in the mouth, pain in the forehead, a yellow skin, &c. &c. it is a bilious fever. If violent vomiting, hiccup, copious stools of undigested matter, followed by variously coloured liquids, with cramps, severe pain, and great shrinking of the surface of the body occur, it is a cholera.

No person dies, according to M. BOISSEAU, of a pure bilious fever, but only of its complications; so that we are here again deprived of the torch of anatomy. After cholera, the mucous membranes of the colon, duodenum, and stomach, are found thickened, with various points of a lively red, and others of a brownish-red, and sphacelated: frequently, also, the intestinal canal is much contracted—an appearance which, according to M. GEOFFROY, is demonstrative of inflammatory action. When the head is severely affected, the pain in the epigastrium diminishes, or perhaps ceases altogether; but we may observe, at the same time, that pressure on this point, although

not productive of pain to the apprehension of the patient himself, will nevertheless produce that shrinking of the features, which occurs during real pain. If you press upon the epigastrium, and, at the same time, watch the face of the sufferer, you will perceive a contraction of the eyebrows, similar to frowning, which is renewed at every repetition. From this fact, the physiological physicians infer that there is a real nervous action produced, of a nature similar to that which occurs in the production of pain; but that the disorder of the brain renders it incapable of perceiving the sensation. By the caprice of artificial classification, we are prevented from being able to assign any morbid appearances as characteristic of bilious fever; as if death occur, the alterations found are referred to ataxic, adynamic, typhus, &c. terminations, or to inflammatory complications. Analogy to cholera, however, of which men are permitted to die, together with the great similarity of the exciting causes to those of cholera, and with the strong marks of irritation about the stomach, evidently points out the latter as the first scene of the morbid derangement.

In fact, bilious fever seems to have been singularly neglected in the labours of those who have supplied us with our most familiar definitions. Dr Rush, in his outlines, scarcely mentions it, as occasionally producing the symptoms of synochus. Dr Cullen cannot be properly said to mention it at all; or Dr Darwin. Dr Good makes it a sub-species of "enecia cauma," or inflammatory continued fever; and treats it with corresponding brevity. We are thus left, for the acquisition of clear ideas, to the descriptions of epidemics; undoubtedly a very excellent resource for practical purposes, but not at all a good one for definitions. Whatever efforts may be used to demonstrate the origin, in any particular manner, of bilious fever, can hardly be said to be in opposition to the established opinions; as it is nearly, if not quite impossible to ascertain on this point, what the established opinions are. This omission of so important a class of diseases, is at least singular; particularly in the authors most commonly used as text books over a country, where these complaints so frequently abound.

The *biliousness* is considered by our author, after professor Broussais, as the result of a sympathy extended from the primæ viæ to the liver; most probably along the course of the biliary ducts. Nothing is said, here, of the *torpor* of the liver, and the absence of bile, which are occasionally so alarming. When biljous symptoms

are wanting, in a gastric fever, the case is so much simpler. The predisposing stage of bilious or other gastric fever, is considered by M. Boisseau as identical with dyspepsia or indigestion; and as generally arising from undigested or excessive aliments or other stimulation to the stomach. The *treatment* adapted to this stage, hence, becomes a matter of interest, not only as a prophylactic, but as throwing light on the character of the subsequent disease. He finds warm, diluting drinks the best and sufficient treatment; operating both by vomiting, without any increase of irritation, and by favouring the discharge of undigested matters and excessive bile by stool. M. Pinel recommends emetics as a remedy of general use. M. Broussais, as is well known, believes these to aggravate the disease in a great number of cases. Our author states the frequent occurrence of a greatly increased severity in the symptoms of the disease, after using emetics; and the opinions of many physicians of the school of Pinel, that the remedy unlocks the disease, and suffers it to develop itself. This Dr Boisseau believes to be not a development, but a real augmentation of the fever. The experience of physicians will decide for themselves: our own impression, however, distinctly is, that where the presence of actually offending materials, such as undigested food, spirituous liquor, or bile in considerable quantity, in the stomach, is distinctly proved, emetics of ipecacuanha have, in almost every case, been beneficial. We must in honesty, however, plead guilty to having repeatedly seen fever increase after the use of such remedies; although we have seldom used them. Enough is certainly proved to justify an earnest care to avoid all unnecessary irritation of the already disordered stomach in procuring the desirable evacuation.

If there be redness of the edges and point of the tongue, whiteness of its central portion, loss of appetite, acidity, decided repugnance for wine and spirits, a sense of weight at the epigastrium, and perhaps a slight weakness of the legs, the case is a light or mild gastritis (légère). The treatment is—entire abstinence, the use of mucilaginous or acidulous drinks sweetened, or even, if the patient demand it, of pure cold water, and moderate exercise in the open air. The emission of blood can generally be dispensed with; but if a greater severity exist, a dozen (large) leeches are to be applied over the epigastrium. Up to this period, says Dr B., we could defy the nosologist to decide whether the case be a proper inflammatory fever, or a gastric one. For the physiological physician, the prob-

lem is entirely solved: he knows that he is dealing with a gastritis; and that nothing should be neglected which may prevent it from increasing.

When a fever is completely formed, with vomiting, and other marks of gastric fever, but without bilious symptoms, twelve, fifteen, or twenty (large) leeches are to be applied to the epigastrium; and the bleeding from their bites promoted till such an amelioration is produced as authorizes a hope of cure: the process to be repeated in proportion to the intensity of the disease and the strength of the patient. Dr B. prefers the keeping up a very long continued hemorrhage from a small number of leeches, to frequent repetitions, a preference which, in the use of American leeches, we of course cannot exercise. Leeches, with him, are occasionally liable to produce inflammation and abscesses of the cellular membrane; and this is an additional argument for prolonging the hemorrhage from their bites.

We read so often in mere general terms of the "boissons mucilagineuses, acidulées," that it may be well enough to particularize those recommended in this work; and we can say, from experience, that their choice is by no means a matter of indifference. The acidulation should be weak; and this should be omitted as soon as the patient perceives a sensation of *pinching* in his stomach. Lemonade is generally useful. Orangeade, prepared in a similar manner with orange juice, often answers better. Gooseberry water may be used for change, or as a substitute; but it does not agree so well with the majority of stomachs. Decoctions of cherries, the "pomme de reinette," and other acidulous fruits, and of sorrel, are valuable; and whey is often very advantageous. Mucilaginous drinks are sometimes to be suspended, from producing a sense of weight in the stomach, and a clamminess in the mouth. They are such as gum arabic water, light decoctions of marsh-mallows, of "chiendent," [Erythronium dens canis?] barley water, and toast water, observing that the two latter should not be heavily loaded with fecula. *Pure water!* is, in a great number of cases, the best of all possible drinks. For the possession of this luxury, so often refused to the parched and broiling fever patient from fears which had their origin in the doctrine of *coction*, our author cites the at least respectable authorities of Hippocrates, Galen and Celsus! We have, for many years, been in the habit of permitting moderately cool water in these cases, and are glad of the occasion to furnish

the sufferer with this additional defence of the propriety of what he craves. Drinks should be taken in small quantities and often; an observation of peculiar importance during a tendency to vomit. The patient should be urged not to take a large quantity, but to drink with sufficient frequency. Sometimes but a single spoonful is advantageously given, and that at long intervals. Great pains should always be taken to ascertain the articles, and the manner of administering them, which agree best with the inflamed viscus in each particular case. The *temperature* of the drink may generally be left to the feelings and wishes of the patient himself, who is often the best judge. Exceptions are found in the use of cold water to check, and warm water to promote vomiting, of warm drinks during chills, of hot fluids in certain particular cases, from idiosyncrasy or otherwise, &c.

The interdiction of articles of heavy digestion is, as our author very fairly remarks, somewhat unnecessary, as the patient generally can be hardly prevailed upon to swallow them; but a not unfrequent abuse, met with commonly enough in our country, is the great anxiety of nurses to induce patients, often against their own inclination, to take *broth*. Dr Boisseau unites with professor Broussais, in carrying this objection so far as to say, that it is quite possible for the lightest broth to produce fatal relapses. Strong disapprobation of this error ought, if possible, to be impressed on the popular mind; as the difficulty is extremely enhanced by the idea, derived from the former opinions of physicians, that it is necessary to give *strength* to the patient.—Demulcent emulsions are only admissible, when the irritability of the stomach is very moderate; and the same may be said of Seltzer water, which should be weakly charged with gas.

Warm, emollient *fomentations*, or light cataplasms, are placed over the abdomen, and have the advantage, in addition to their direct effect, of promoting the bleeding from the leech bites.

Costiveness is not considered a very important complication of gastric fever; and this forms one of the strongest points of dissimilitude between the French and English practice. Dr B. acknowledges, however, that it does produce headach and febrile heat; but conceives that the only means which should be employed for its relief, are injections of water, either pure, or mixed with mucilage, vegetable acids, oil, or honey. We do not stop here to discuss this much debated question, which has almost become national. The

prohibition of purgatives is well understood to be on the ground that they create additional irritation in the inflamed and sensitive viscera; and it is asserted that experience has pretty uniformly shown disadvantageous consequences from their use. We presume our readers will hardly be willing to subscribe to this last statement; and yet we think it will be found to be *sometimes* correct. Without imitating the practitioner in the tale, who noted down that "salt herring cures an Englishman in a fever, but kills a Frenchman," we will ask, is it quite impossible that there may be a difference in the idiosyncrasies of nations? We have heard it said that the Americans eat more than the French. Can this render it probable that purgatives would be both more useful and better tolerated with the former?

The headach commonly ceases when the other symptoms are relieved, as it is originally only sympathetic; but, if it be severe, it indicates hot pediluvia, including those with mustard, cold applications to the forehead, and leeches to the temples.

It is hardly necessary to add, that *vomits* are decidedly contra-indicated.

The diagnostic symptoms which M. Boisseau uses, to separate bilious fever from the form of which we have just been speaking, are, pain in the right hypochondrium, a thick yellow coating over the middle space of the tongue, which is dry, with its point and edges as in the former case, a bitter taste in the mouth, a more strongly marked repugnance for food, especially rich substances, the vomiting of bilious matter, coloured yellow or green, &c. extreme hardness of the pulse, greater acrimony in the heat of the surface, yellow skin and eyes, a more acute pain in the forehead, temples, and base of the brain, and a thickness and deep yellow colour of the urine. Some of these symptoms imply merely a greater extent or violence of the disease. The treatment implies a commencement by the means already enumerated, under which the hepatic symptoms will frequently yield; but should they prove more refractory, leeches must be applied to the right hypochondrium, or to the anus, and warm baths must be employed. *Calomel*, we see, is omitted.

The author next describes the circumstances under which he thinks that an emetic *may* be prescribed. They amount to this, that, in the preliminary stage of *embarras gastrique*, provided there are no symptoms of fever, nor soreness at the epigastrium, and particularly when there are no signs of hepatitis, if

the symptoms do not yield to the previously described treatment, we can give an emetic if we choose. Whenever there is heat of the skin, acceleration of the pulse, and unusual redness of the tongue, it is formally contraindicated. Of course, the use of vomits during *fevers* is decidedly objected to under any circumstances. In this place follows a defence of the well-known French opinion, that vomits should never be given till after a preparation by diluting drinks; an opinion which often seems absurd to those unaccustomed to it. Dr B. maintains it on the principles of the physiological medicine; and admits the use of emetics in the decline, or, to speak more correctly, after the termination of fevers, we can hardly tell with what object. His rules are nearly the same thing with a mere prohibition; but they may be used in those affected with transient bilious diarrhœas, in those accustomed to take vomits annually, in stomachs simply overloaded, and not, at the same time, unduly stimulated, in persons corpulent, pale, with soft flesh, and of little excitability, in cold and wet countries, and in high northern latitudes.

M. Boisseau states that, by the preceding treatment, gastric fevers are entirely removed, sometimes in a single day, ordinarily in a very few, and most generally in a week. They are never seen to be prolonged for two or three weeks, and still less for a month or six weeks, "as so often happens when vomits are insisted on."

Hepatic symptoms sometimes continue for a few days, after the gastric derangement has ceased, and without being accompanied with any fever. In these circumstances, a saline purge may be given with advantage; but diets and drinks will commonly suffice.

Our author's reflections on *cholera* will not detain us. It is inflammatory; but he does not possess personal experience, nor is there in his reach a sufficient number of well ascertained and well described cases.

In the course of gastric fever, there occur occasionally inflammatory affections of the bronchiæ, the parenchyma of the lungs, the pleura, the kidneys, or the bladder. In these cases, leeches should be applied, and sometimes blood taken from the arm; as it is unsafe to wait for the spontaneous subsidence of these complications, and they may do irreparable injury before the termination of the disease.

Inflammation of the peritoneum sometimes occurs in these fevers; but Dr B. postpones the consideration of it, as such cases are classed among adynamic, or our typhoid, fevers.

The *period* at which patients may be permitted to return to their ordinary food, is a point of great importance. "Broth should never be allowed till the skin has lost the *calor mordens*, and its temperature is but very little elevated above the ordinary height; and it is better even to wait for its entire return to the natural standard, and until the pulse has ceased to be hard and frequent, and the tongue to be red at its point and edges." It is beneficial to dilute the broth with vegetable decoctions. Afterwards we may add a light decoction of rice, barley, bread, or vermicelli, and subsequently soup. The return to ordinary food should be gradual. The patient should for a long time refrain from wine; especially when unmixed with water. Previously to using meats, he should be kept on stewed and preserved fruits, and on legumes. If costive, he should employ enemata, and a laxative diet: veal broth, decoction of sorrel, tamarinds or prunes, and whey, are recommended. Purgatives should never be used but in two cases; either where the appetite diminishes, and the tongue becomes foul, without fever, or, secondly, where the patient is accustomed to their prophylactic use at stated periods. Purgatives are liable to bring on relapses; and these occur still more frequently from overloading the stomach. Hence a continuance of the same regimen is inferred to be the best protection during convalescence: to which may be added moderate exercise, and, in young persons, the cold bath. "The administration of tonic medicines, far from shortening a convalescence after bilious fever, may suffice to render it *interminable*."

We have been thus long and minute upon the subject of bilious fever, because it is in its nature elementary; furnishing a fair specimen of the nature and treatment, according to the "physiological school," of *gastro-enteritis*. We shall now be the better prepared to enter upon the more complicated forms. We propose to ourselves the consideration in a future number, of those forms of fever generally known among us by the appellation of typhus.

ARTICLE IX.—*Recherches Anatomiques et Physiologiques sur la Structure Intime des Animaux et des Vegetaux, et sur leur Motilité. Par* M. H. DUTROCHET, *Docteur en Médecine, Correspondant de l'Institut de France dans l'Académie Royale des Sciences, Membre Associé de l'Academie Royale de Médecine, des Sociétés Philomathique, Linnéenne, et Medicale, d'Emulation de Paris, des Academies de Rouen, de Lyon, de Toulouse, &c. Avec deux Planches. A Paris*, 1824.

Anatomical and Physiological Inquiries into the Intimate Structure and Motility of Animals and Vegetables. By M. H. DUTROCHET, M.D. *&c. &c. With two Plates. Paris*, 1824.

L'Agent Immediat du Mouvement Vital, devoilé dans sa Nature et dans son Mode d'Action, chez les Vegetaux et chez les Animaux. Par M. H. DUTROCHET, *Correspondant de l'Institut dans l'Académie Royale des Sciences, Membre Associé de l'Academie Royale de Médecine, &c. Nil tam difficile est quin quærendo investigari possit.* (*Terence, Heautontumorumenos.*) *A Paris*, 1826.

The Immediate Agent of Vital Movement, displayed in its Nature and Mode of Action, both in Vegetables and Animals. By M. H. DUTROCHET, M.D. *&c. &c. Paris*, 1826.

It has been a matter with us of frequent regret that we have not been able to furnish our readers at an earlier period with an analysis of the two works, the titles of which are given above. But various reasons of a nature already alluded to in our last number have interposed to prevent the execution of our wishes in this particular.

Doctor DUTROCHET has always evinced a partiality for the study of minute structure, and inquiries into what may be called the mooted points of physiology. We wish there were fewer of them. His inaugural dissertation in 1806 was on a New Theory of the Voice. Since then he has written essays on the following subjects; Habit and Sympathies; a new Theory of Harmony; Inquiries into the Rotifera; into the Envelopes of the Fœtus; and into the Metamorphosis of the Alimentary Canal of Insects; History of the Eggs of Birds before they are laid; Observations on the Structure and Regeneration of Feathers, with some General Considerations on the Composition of the Skin in Vertebral Animals; Inquiries into the Growth and Reproduc-

tion of Vegetables; and Observations on Osteogeny; together with some other questions in natural history. Most of these have been inserted in some scientific journal, such as the *Journal de Physique*, and *Memoires du Museum d'Histoire Naturelle*.

The author of these works, acting up to his belief that all the classes of organized beings ought to be carefully examined and compared with each other, since the same general laws govern all, has devoted much time and labour to vegetable physiology, with a view to its application to animal physiology. His success has not we think been small in this part of his inquiries. But that our readers may be enabled to judge for themselves we shall begin, forthwith, our duty of analysts. In the introduction to the first work, on the Intimate Structure of Animals and Vegetables, Dr Dutrochet, after some remarks on sensibility and on its being applied to express the consciousness of certain impressions made on a living body, and of course on its being an objectionable term in physiology, conveying as it does a purely moral intellectual idea, proposes the suppression of the word. Of the precise nature of the movement, produced by external agents which modify the senses on which they act, we are ignorant. He proposes affixing to this phenomenon, produced in the senses by external agents and transmitted by the nerves, the term *nervimotion*, and to the vital property in virtue of which it takes place, the term of *nervimotility*. Those external agents capable of producing nervimotion are called by him *nervimotor agents*. Nervimotion is purely a physical phenomenon, constantly preceding the moral one of sensation, but not necessarily followed by it. Hence our internal organs possess nervimotility, they experience nervimotion; but sensation does not result as is the case with our external organs. Life, in regard to its physical relations, is nothing else but movement; death is the cessation of this movement. Living beings exhibit different faculties of movement, the chief of which is *nervimotility* or the power of experiencing certain modifications or changes in their existence, by means of particular agents from without, *nervimotors*. This first movement, which is invisible, is the source of the visible one, executed by living organs. The faculty of executing these movements, by which a displacement of parts is operated, may receive the name of *locomotility*: it presents two movements of an opposite nature, *contraction* and *turgescence*. All these powers of movement are referrible to a single general power, which the author designates by the name of vital *motility*: it

is life itself. Vital motility exhibits to us in all living beings the same principal vital phenomena. Throughout all we find *nervimotility*, and consequently *nervimotion*, under the influence of *nervimotor* agents: in all there is *locomotility* or the faculty of changing the position of the parts. Vegetables display, as well as animals, these two faculties of movement, but they are much less energetic in the former, and much less distinctly developed. The laws presiding over the vital motility of animals are of very difficult study, on account of the extreme complication of causes, as well internal as external, which exert an influence over the faculty. In vegetables, on the other hand, the study is greatly simplified, and it is probably in them alone that we can hope for a solution of the principal problems of the science of life.

After these premises, Dr DUTROCHET proceeds to inquire into the anatomy of vegetables, and especially into that of the sensitive plant (*mimosa pudica, L.*) He admits that the usual means of observation and discovery in vegetable anatomy have received every variety and latitude of application possible. That he has been able to go farther than his predecessors in this department, is owing to the novel process to which he had recourse for separating the different parts of the internal organs of vegetables. He succeeded in overcoming their adhesion, without destruction of tissue or alteration of intimate structure. After many trials he found the following to be the most advantageous procedure. He put a portion of a vegetable which he desired to study, into a small vial filled with nitric acid, and then plunged this into boiling water. By this operation, the component parts of the vegetable tissue lose their aggregation and become transparent, and the study of them is singularly facilitated. The tracheæ and other vessels are at the same time filled with an aeriform fluid, giving them a peculiar aspect under the microscope, and furnishing us with a new means of observation. It must of course be understood, that this operation is not to be carried too far, otherwise the vegetable tissue would be quite disorganized. The less prolonged the ebullition the better: in general we ought not to wait until the vegetable has become quite transparent and divided spontaneously.

It was the desire of knowing the anatomy of the sensitive plant which led the author to make these researches, and it is the anatomy of this plant which will serve for his text, to be illustrated when necessary, by considerations drawn from the structure of other vege-

tables. He begins by the medulla or pith. It is, like the corresponding part in all vegetables, entirely composed of cellular tissue. The cells present an hexagonal figure, regular in some places, less so in others, and generally arranged in longitudinal series. Not satisfied with the comparison, made by GREW and adopted by MIRBEL, of this tissue to the froth of a fermenting liquor, Dr DUTROCHET examined it after immersion in nitric acid and subsequent ebullition, and found that all the cells separated from one another and presented so many complete vesicles, which preserved the form precedingly given to them by the mutual compression of their sides. Thus, wherever two cells touched each other, the intervening partition consisted of a double membrane.

In the medulla of the sensitive plant, each cell has several rounded corpuscles, opake on their sides and transparent in the centre, an appearance presented by all transparent spherical bodies. They were rendered entirely opake by heated nitric acid, while the cells became quite transparent. Having placed some of them on a piece of glass and added a large drop of a warm solution of caustic potass, holding the whole over a spirit lamp, he found the corpuscles regain their primitive appearance. The next question was, what office did these corpuscles, concrescible by acids and soluble in alkalies, perform. The answer must be sought by comparing them with the agglomerated globular corpuscles of animals, which microscopical observation has shown to be analogous to those in the organic tissue of vegetables. But as nothing can be inferred from the figure of these globular corpuscles, which entirely compose the organs of animals, we must have recourse to differences in their chemical nature. Accordingly we find that those of which the muscles are constituted are soluble in acids, whilst those entering into the composition of the nervous system are insoluble in acids, but soluble in alkalies. The latter are the characters of the globular corpuscles of vegetables, and would lead to the conclusion, that these bodies are nervous organs, or rather the scattered elements of a nervous system. This belief is strengthened by a comparison of the structure under consideration with the nervous system of the mollusca gasteropodes, the medullary substance of the brain of which consists of agglomerated globular cells, on the sides of which are seen a great number of globular or ovoid corpuscles, represented in figure 20 of the plate, attached to the work. These remarkable analogies, taken in connexion with the singular phenomena

presented by what are called the *irritable* vegetables, do not, says Dr Dutrochet, permit us to doubt, that there is something similar in them to the functions performed by the nervous system in animals, and tend to prove that there is, if not a nervous system, at least some of the elements of one in plants. Influenced by these considerations, he designates the globular corpuscles of a concrescible nature, situated on the sides of the cells of vegetables, by the term *nervous corpuscles*. This he uses in place of the periphrase of a *microscopical globular cell, filled with nervous matter*.

We have neither time nor room to give the author's criticisms on Mirbel and Link's opinions respecting the arrangement of the trachea in the medullary sheath. It is sufficient for us to repeat, after him, that these parts are studded externally with nervous corpuscles—an arrangement very evident on the stalks of the *solanum tuberosum* and *cucurbita pepo*. Alongside of the tracheæ are vessels double the size of these latter, and called by Mirbel porous tubes or false tracheæ, but which Dr D. discovered to be corpusculiferous vessels; that is, tubes lined on the inside with numerous nervous corpuscles. (Fig. 8. 9. 10. 11. 12.) He thinks that these latter are the ascending sap vessels of the plant: they are found not only in the medullary sheath, but in the whole central system of the plant, and, in ligneous vegetables, are especially seen in the spaces between the annual layers of the wood. They abound in the wood of the vine, and it would seem to be by their orifices that the sap flows out so abundantly, when the branches of this plant are cut in the spring. No small force presides over this movement of ascension, which, be it now said *en passant*, cannot be the effect of capillary attraction; since the sap does not rise in the dead branches, which are contiguous to and continuous with the living part of the plant, although the former retain their capillarity.

The functions of the tracheæ have been the subject of many discussions among naturalists. Some considering them as analogous to the tracheæ of insects have styled them respiratory organs; others affirm that these tubes never contain air but sap, an opinion which Dr Dutrochet thinks the correct one. They are, he says, assuredly the conductors of a diaphanous liquid, and never, in their natural state, do we find a single globule of air in them. They may indeed by boiling in nitric acid be, in common with all the other tubes of the plant, filled with air; but then their appearance is peculiar, and very different from that presented in the living vegetables. They have a

necessary and immediate connexion with the functions of the leaves, in which and the medullary sheath only they are found—parts these in the young branches in intimate relation to each other. With the offices performed by the leaves, we are not yet perfectly acquainted, notwithstanding the investigations of INGENHOUZ and SENNEBIER, and above all the more extended labours of THEODORE DE SAUSSURE. It is, however, a point well ascertained, that light exerts a special *vivifying* action on the leaves, either by itself, or by causing certain chemical changes in the fluids of their vessels. The tracheæ would seem then to serve the purpose of transmitting to the body of the plant the fluid thus modified and vivified in the leaves by the action of light.

The part to be studied next is the ligneous, which covers the medullary sheath. This is possessed by the sensitive plant, though it be herbaceous. The wood is, we are told by the author, composed chiefly of tubes, cylindrical in their middle, and terminating in conical points (fig. 13.) These fusiform tubes he calls closters, the sides of which touch each other at the centre, while the intervals between the points are filled up by the ends of other closters. Several of these are separated into two equal parts by transverse partitions. The solidity of the vegetable tissue more particularly depends on these closters, which are the reservoirs of a juice capable of concretion and of acquiring a great degree of hardness. It is by this means that the alburnum is converted into wood. The colouring matter of different kinds of wood depends not on the closters themselves, but on the concrete juice with which they are filled. On this last depends likewise the relative hardness of the ligneous portion, for the closter has the same dimensions in the box tree (*buxus sempervirens*) and the poplar, that is to say, in the hardest and softest wood.

The closters seem to be, in the alburnum, or sap wood of recent formation, the reservoirs of elaborated sap, specially destined to furnish matter for the nutrition of the plant in its diameter, and which, transmitted from closter to closter, by a descending movement, supplies the roots with materials for their growth. The author thinks that it is by means of this admixture of the elaborated with the ascending sap, that the buds receive matter for their growth, and that the former furnishes to the proper vessels materials for their secretions. It is by a similar diffusion of an elaborated juice that nutrition and secretion are performed in insects.

The fasciculi of closters are blended in the sensitive plant with a cellular tissue, which can be mechanically divided into longitudinal filaments consisting of a series of cells (fig. 15.) To this arrangement the author gives the name of *articulated cellular tissue*, which, continued in a longitudinal direction, is observed to become tubes. This cellular tissue resembles that of the medulla or pith, and like the latter is covered with nervous corpuscles irregularly arranged. It is the generating organ of the medullary rays in the ligneous and herbaceous plants.

The cortical system of the sensitive plant is composed of closters larger than those which are found in the central system, but resembling them in being destitute of nervous corpuscles. Both contain a liquid, concrescible in cold and soluble in hot nitric acid. Reasoning from this perfect identity of structure and chemical composition, the author thinks himself justifiable in giving to the pith the name of *central medulla*, and to the parenchyma of the bark that of *cortical medulla*.

The leaves of the sensitive plant are borne on a long petiole, at the termination of which is a swelled portion which Dr Dutrochet calls *bourrelet* (fig. 18.) Similar enlargements, but proportionately less, are seen on the insertion of the pinnules into the petiole, and at the junction of the leaflet with the pinnule. In these enlargements exists the moving principle of the plant, as we shall see hereafter.

An investigation of the structure of the joint, or the *bourrelet*, formed by the union of the petiole with the branch of the plant, shows it to be chiefly composed of cortical parenchyma, which is itself made up of globular and diaphanous cells, the sides of which are covered with nervous corpuscles. The cells are precisely similar to those already noticed in the medulla and cortical parenchyma. In addition to these parts, we discover elongated closters, which form as it were the bark of the petiole, and in its interior are articulated and corpusculiferous cellular tissue, and large corpusculiferous tubes. In the centre of the petiole are spiral tracheæ.

The leaflets contain an immense quantity of nervous corpuscles, discoverable by the means already indicated: they are very minute, in groups around the ribs, or rather the vessels traversing the leaflets.

The root of the sensitive plant exhibits, in its central system, closters blended with large tubes, precisely similar in their

form, size and position to the corpusculiferous ones of the stalk; but they have not nervous corpuscles on their sides; although we may presume that their absence is apparent rather than real, and may depend on their extreme minuteness. The articulated cellular tissue is arranged in medullary concentric rays in the large roots, and in longitudinal filaments in the radicles: its nervous corpuscles are very transparent and are not rendered opake by nitric acid. It is known that there is neither medulla, nor medullary sheath, nor tracheæ in the roots. The cortical system of the root does not differ essentially from the same system in the stalk, as regards anatomical arrangement. Dr DUTROCHET could not, however, discover that the cells of its parenchyma contained a fluid concrescible by acids.

If a young stalk of the sensitive plant, or the joint of the petiole of one of its leaves, be cut, we see immediately escape a drop of a diaphanous liquid, which, examined by the microscope, seems to be composed of a great number of transparent globules. These, when a drop of nitric acid is applied, are promptly rendered opake, and are restored to their fluidity by caustic potass.

The different hollow organs which we have pointed out in the vegetable tissue, viz. cells, tracheæ, membranous tubes and closters, have no other relation to each other than that of contiguity. There is no direct communication between their cavities; nor can their contained fluids be transmitted from one to the other, but by the pores of their sides. But in admitting this, the author does not think MIRBEL's opinion of there being visible pores well founded. As each organ has its own membrane, the fluids must traverse the two contiguous sides, in order to pass from one hollow organ to another.

We have thought it proper to premise thus much of the anatomy of vegetables, as well that the reader may better understand the physiological part of the works before us, as for the purpose of future reference, comparison, and illustration.

The second section consists of *observations on the movements of the sensitive plant.* These, as the author very justly remarks, have been a fruitful theme for inquiries and speculations with the learned, and yet we are still in ignorance of the organic tissue, which evinces the faculty or property called *vegetable irritability*, a faculty not yet distinguished from *sensibility* by physiologists: or to adopt his own phraseology, we are ignorant, whether *nervimotility* and *locomotility* have a separate existence in the sensitive plant. Anatomy can alone

guide our inquiries in these questions. By it, as set forth in the preceding pages, we have learned that the sensitive plant possesses a well developed nervous apparatus, especially evident in the leaves and the enlargements (*bourrelets*) of their articulations. Is this nervous apparatus the seat of the locomotility of the plant, as it is of its nervimotility?

We find at once an obvious difference in the movements of displacement, presented in the parts of vegetables, from that met with in the limbs of articulated animals. The former have no mobile articulations like the latter: their locomotion is always brought about by means of an inflexion of parts endowed with great pliancy and softness: their organs of motion are in the very spot in which the flexion is produced. It is here that the organic tissue undergoes an internal movement, which determines the flexion or straightening of the part. In observing the movements of displacement in the sensitive plant, we see that on the slightest touch or commotion, its leaves close with great rapidity; a phenomenon which takes place as follows. The leaflets incline by pairs to each other, so that their superior surfaces are in contact, and they approach their common axis or the pinnule; the pinnules bend by an approximation to their common axis, which is the petiole, at the summit of which they are inserted by pairs; the petiole next bends by being averted from the stalk in which it is implanted. This movement of removal on the part of the petiole is so great, that it inclines towards the earth in approaching that portion of the stalk below its insertion; hence its movement is in an inverse direction to that of the pinnules and leaflets. All these movements are performed by means of the flexion of certain knots or *bourrelets* at the base of these mobile parts. The *bourrelet* of the petiole being the only one large enough for examination, the inquiries of the author were chiefly directed to ascertain what portion of it is the organ of motion, the central fasciculi of tubes, or the delicate cellular tissue containing globular cells and nervous corpuscles.

The whole cortical parenchyma of the *bourrelet* was removed by gently scratching it with a sharp penknife, so that the central fasciculus of tubes was completely exposed. The leaf was not destroyed by this operation; but the leaflets remained some days without being unfolded or expanded, and the petiole lost the power of moving. The two movements of flexion and straightening or extension seemed to indicate the connexion between these functions

and the upper and superior parts of the knotted joint or *bourrelet*. Accordingly, Dr DUTROCHET found, that a removal of the parenchyma of the superior part was followed by inability of the petiole to incline towards the earth, that is to perform the movement of flexion, whilst destruction of the inferior portion prevented the extension or straightening of the petiole. This latter is not, however, to be regarded as a passive process, or the mere resumption by the petiole of its former position, after the power of flexion is quiescent. The difference is merely in the direction, the action on one side of the joint inclining the leaf to the earth, but on the other directing it to the heavens. For the vigorous performance of either an abundant supply of sap is required; between which and the motility of the leaves there is a very intimate relation. The author discovered also that the elastic force by which the above movements of *incurvation* are performed is evinced in slices, however minute, of the *bourrelet*. This phenomenon was more particularly observable, when they were immersed in water, and then according as the slices were taken from the upper or lower surface, would be the direction of their curvature. If immersed in other fluids such as an acid or alkaline solution, the curving movements were immediately arrested, showing that *elastic incurvation*, either in parts or in the whole of the joint of the leaf, is a vital phenomenon.

But we must not consider the *bourrelet*, or joint, as composed of merely two sets of antagonizing springs, inferior and superior. A lateral flexion may be produced by deranging the natural direction of the leaves of the plant to the light, and in fine, the petiole may move in every direction. We find, accordingly, that while the leaflets and pinnules move in the sense of *adduction*, by inclining towards the superior part of their common axis, the petiole, on the contrary, is moved in the sense of *abduction* by withdrawing from the superior part of the stalk in which it is inserted.

This vital incurvation is seen not only in the sensitive plant, but in the *hedysarum gyrans*, the oscillatory incurvation of which is exercised in directions alternately opposed to each other. The *cactus opuntia* and *berberis vulgaris* also exhibit it in their stamina, as does the *dionæa muscipula* in its leaves. Besides the oscillatory there is likewise a *fixed incurvation* much more common than the first: an example is presented in the ovary of the balsam, the valves of which at the epoch of maturity are separated from each other and

rolled into a spiral form. Their first mutual adherence was in virtue of their elastic power, or tendency to incurvation.

The next point to be determined is, whether vegetable incurvation is the result of nervous action brought into play by external agents. The author thinks he can demonstrate the affirmative very clearly. Thus when a stimulus is applied to a particular part of the sensitive plant, remote from the articulation or *bourrelet*, and produces motion in this latter, we may infer that nervimotility and locomotility are distinct properties. In other words, when the sun's rays are directed through a lens on a leaflet, and which thereby promptly approaches its fellow, and the adjoining leaflets in gradual succession downwards meet each other, to be followed in similar movements by the mutual approximation of the pinnules, and the flexion of the petiole, we cannot doubt that there exists an invisible movement, a vital phenomenon anterior to locomotion, and consequent on the application of an external cause. This phenomenon is *nervimotion*, invisible of itself and only appreciable by its effects. Whilst locomotility is circumscribed in the articulations or *bourrelets* of the plant, nervimotility on the contrary is diffused throughout all parts of it; an inference which, independently of the evidence afforded by the vital phenomena of vegetables, we should be inclined to draw, from the fact of the nervous organs or the elements of a nervous system being found in every part of the plant. Hence, if a burning glass be directed to the flowers of the sensitive plant, though there ensue no motion in them nor in their long common peduncle, yet nervimotion is produced, for we see, after the lapse of a few seconds, the leaves of the stalk bend towards each other. The same effect follows the application of heat to the flower bud or to the bark of the stalk. When a leaf is completely folded so that there is no farther appreciable motion, it is still susceptible of nervimotion, since the ustion of its leaflets provokes the folding of the other leaves of the stalk.

Here we are naturally met by the question, whether, as nervimotility belongs to all parts of the plant, it is the attribute of special organs or is possessed by all the internal ones. It is not necessary for us to give the details of the author's experiments on this point. He found that the removal of a portion of the bark did not prevent the transmission of nervimotion to the leaves beneath, nor was this process materially affected by the destruction of the pith, nor by the simultaneous removal of the bark and pith. The com-

munication between the upper and lower parts of the plant by means of the ligneous tissue was sufficient for the phenomenon of nervimotion to take place. In the converse experiments of removing all but the bark, or the medulla, respectively, it was discovered that neither of these parts was endowed with nervimotility, or the power of nervimotion. Still farther, the cellular tissue of the articulation or *bourrelet*, filled with nervous corpuscles, was found to be incompetent to transmit stimuli or to experience nervimotion: hence this invisible movement is restricted to the ligneous portion of the plant. Of the organs or vessels in this latter, the author found that the sap vessels, or the corpusculiferous tubes, were the only ones capable of performing this function; and in these, the transmission is accomplished, not by the nervous corpuscles, with which they are so fully studded, but by the medium of the sap itself. In a word, he finds the transmission of the sap united inseparably with the transmission of nervimotion; an inference which we should hardly have drawn from the premises laid down by the author. He attempts, indeed, to qualify it by saying, that although the nervous corpuscles are strangers to its transmission, they are still the generating organs of this power.

Nervimotility belongs to the roots as well as to the stalk of the sensitive plant; a circumstance evidenced by an experiment of the celebrated botanist DESFONTAINES. If the roots be sprinkled with sulphuric acid, we soon see the leaves of the stem folded on each other, those nearest the root undergoing this movement the first.

The transmission of the nervous power, or nervimotion, is brought about with some slowness in the sensitive plant. It is quicker, however, in the pinnules and petioles than in the articulations of the stalk. Temperature was not productive of any marked effect on this phenomenon, except the cold was considerable: when the mercury in the thermometer fell to 48 degrees F., ustion of the plant on such occasions failed to produce any effect. Solar light exerts a most remarkable influence over the motility of the sensitive plant, a fact hitherto suffered to pass unnoticed by naturalists. When kept in a dark place, even though the temperature be elevated, its leaves are soon folded. But this diminution of motive power was not accompanied by any delay of nervimotion, only the extent of propagation was less than common. The higher the temperature of the air, the sooner and more completely did the plant lose its motility when removed from the light. Hence, if exposed to a heat of from 81 de-

grees to 83 degrees F., its motive power was entirely destroyed, in a period of four days and a half of obscuration; whereas, ten days were required of similar exclusion from light to produce the same effect in a temperature of 63 degrees to 77 degrees F. Exposure of the plant to the sun restores with great promptness its motility; the light of day has the same effect but in a slower manner. A few hours of the former agency are equivalent to as many days of the latter.

It is no forced induction then to admit, that light exerts over vegetables an influence similar to that displayed by respiratory oxygenation on animals. *Insolation* is to the former what *oxygenation* is to the latter; and *etiolation* is for vegetables a condition very analogous to what *asphyxia* is for animals. Still more, we learn from Dr Edwards's experiments, detailed in our last number, that asphyxia is much more rapid in warm than in cold blooded animals; and that in these latter it may be accelerated or retarded by augmenting or diminishing the temperature of the medium in which they are immersed. Now we have just seen that the sensitive plant undergoes in its motility similar modifications from external temperature.

Our notice of the third and fourth sections of the work will be very brief, as we consider them but episodes in the main argument. The author in them treats *of the peculiar directions affected by the different parts of vegetables*, and *of the influence of rotatory movement on these directions*. He has been, it seems to us, more successful in showing the fallacy of the hitherto received explanations of these points, than in carrying us farther back in the chain of causation. The ascending direction of the stalks and trunks of vegetables and trees, and the descending one of their roots, are vexed questions in vegetable physiology. Some have thought that the radicles of a plant were necessarily directed to or attracted by a humid soil, and that the plumula and stem had a constant tendency to the atmosphere and to light: but Dr Dutrochet has satisfied us, independently of the experiments of others, that this is not the fact. The embryo of misletoe seed directs constantly its radicle towards the centre of the branch of any tree on which it is fixed, or even of glass or metallic balls. The inference is, that the radicles of *terrestrial* plants are obedient to the attraction of gravitation; whilst the radicle of the misletoe or other parasites follows the particular attraction of the body on which it is placed. It may be added that all parts of a vegetable have a tendency to affect a direction perpendicular to their surface of im-

plantation or insertion. Branches from the main trunk or stem, and roots around the central one, take a direction compounded of their tendency to grow in a line perpendicular to these parts, and of their other tendency to follow the general attraction by which the root is carried downwards, and the stem, stalk or trunk upwards. Hence roots and branches make an angle with the vertical axis of the vegetable of varying latitude.

These movements by which the stem and root of plants take particular directions are, in the author's opinion, *spontaneous*, that is to say are owing to an internal and vital cause brought into action by an external agent. Attraction then does not affect the ponderable matter of a vegetable, but acts on its nervimotility.

Light exercises a special agency over the direction of vegetable growth—as we know from many familiar examples; but this influence is not a paramount one. When a plant is pulled up, which lives under the operation, and is laid on the earth horizontally in a dark place, as in the instance of the onion or leek, the stem undergoes a curve, and the superior part takes its former direction towards the heavens. The same thing occurs whether these vegetables are placed in water in the dark or in daylight. The regaining of their upward direction by the stems is attributed to the conjoined operation of gravitation and light.

The tendency of the stems and branches towards the light is, according to Dr Dutrochet, in virtue of their green colour; and if roots do not in general evince the same tendency, it is owing to their want of coloration. Here, however, we are lost in first causes: light, which is the principal though not the only agent of the coloration of the stem and its appurtenances, has no such influence over roots, whatever be their exposure. Thus an aquatic plant will always have white roots, although they are exposed to the light as well as the submerged leaves which are of a green colour. Singular as it may seem, the green part of some roots, as of the *mirabilis jalappa*, will be constantly directed towards the light, and the white stems, as of some aquatic plants, will grow downwards towards the earth. Hence it is not in virtue of their properties as stems or trunks that plants have an upward direction, but on account of their coloured parenchyma: nor is it by their office of roots that these parts descend into the earth, but because they have a colourless parenchyma.

This serves to explain another phenomenon which has greatly en-

gaged the attention of botanists. We mean the constant direction of the upper face of leaves towards the heavens, and of the lower towards the earth. The tendency depends entirely on the difference in colour: the upper, being generally of a deeper green, seeks the light; the lower, of a fainter hue, inclines to the ground. If the conditions be reversed, as happens in some of the gramina, the lower surface is turned upwards by a kind of torsion of the body of the leaf. When the two surfaces of a leaf are of an equally deep tint, neither has an upward direction: it is the point of the leaf which displays the tendency. The petals of flowers are subjected to the same law of direction which governs the leaves of the plant.

These movements, like the others already indicated, are not, however, effected by the attraction of light or any such physical agency, but are the result of an internal spontaneous movement excited by a particular stimulus operating on the nervimotility of vegetables. This is proved by the fact of its becoming indifferent, to the sensitive plant for example, which side of the leaf is uppermost, if it has been kept in a dark place so long as to lose its motility, and impressibility by stimuli.

The tendency in the leaves of plants to remove from any cover or shelter under which they may be placed is explicable on the same principle, viz. their proneness to direct one or other surface to the light. If the leaves be kept in profound darkness, they make no effort to withdraw themselves from their partial covering or shelter.

The *sleep of plants* is explained by Dr Dutrochet on the principles of vitality. He supposes that the different direction affected by the leaves and flowers of many plants during the night, to that which they preserve in the daytime, is the result of a great and rapid diminution of their nervimotility. Hence any violent nervimotor agent, which consumes rapidly this inherent property, such as a shock or burning, produces a *diurnal sleep* differing in no one particular from their *nocturnal sleep*. He supposes that light is both a source of the renewal of vegetable nervimotility, and an agent for its exhaustion, or a nervimotor; an opinion which, however correct, he does not very clearly substantiate by experiment. He tells us that in the second section of this work, he has shown how light repairs or renews nervimotility in the sensitive plant, which darkness had destroyed or exhausted. We have given his language on that occasion, in which he says that although motility was diminished and

destroyed, nervimotion was no otherwise affected than in the extent of its transmission (p. 83). There is in this some little contradiction, which as far as we have seen is not cleared up in the text.

In the fourth section, on the influence of rotatory movements over the peculiar direction of the parts of a plant, the author gives the results of several experiments, of a nature similar to those already performed by that celebrated vegetable physiologist Mr KNIGHT. He planted seeds in a portion of earth which was kept by a suitable apparatus in continued rotation, and he found after several trials, 1, that the radicle of the germinated seed obeyed the impulse to which it was subjected, and constantly tended in the centrifugal direction, the result of the circular movement, by growing towards the circumference; and 2, that the plumule *reacted* against this tendency, and grew in a direction diametrically opposed to the centrifugal force,—that is, towards the centre. Leaves exposed to a similar rotatory movement constantly directed their superior surfaces towards the centre, and their inferior ones towards the circumference. Hence it would seem that the two opposite faces of leaves have quite contrary conditions of vitality—the superior one exhibiting the same as those of the plumule in being like it directed to the centre, and the inferior imitating the radicle, in being directed to the circumference.

"We now see," says the author, "that under the influence of the same nervimotor agent, the plumule and radicle take diametrically opposite directions. These two parts thus differing in their position have then a different nervimotility, if not in its nature at least in some of its conditions; since the one tends to produce obedience, and the other reaction, in reference to a nervimotor agent which undergoes no variation. There is a nervimotility a principle of obedience, and a nervimotility a principle of reaction. These two opposite modes of nervimotility being located in entirely opposite parts, we cannot fail to recognise therein a phenomenon quite analogous to what is called polarization in natural philosophy. Nervimotility or rather its unknown agent presents truly two poles in vegetables; the roots being the seat of the *obeying*, the stalks of the *reacting pole*. These said poles are located on the two opposite sides of the leaves; the *reacting pole* is on that side usually directed towards the heavens and light; the *obeying* pole is on the surface which looks towards the earth. We have seen, in the preceding section, that the direction of these parts, which are considered as different poles, invariably coincides with a difference *plus* and *minus* in their coloration. The obeying pole is always of a less deep colour than the reacting one; and consequently there is an excess of certain conditions in one, while they are in less degree in the other. I am inclined to believe that these visible differences, *plus* and *minus*, coincide with corresponding differences, that is to say *plus* and *minus*, in the conditions of nervimotility."

Dr Dutrochet next proceeds to a consideration of the intimate structure of the nervous and muscular systems of animals, and the mechanism of vital contraction.

The nervous system of animals, observed in its microscopical elements, is composed essentially of agglomerated corpuscular globules, which seem to be cells of extreme smallness containing a nervous or medullary matter, concrescible by heat and acids. The two small symmetrical bodies at the summit of the nervous system of the gasteropodes mollusca, corresponding to the brain in the more perfect animals, exhibit, after their fibrous envelope is removed, two small pulpy kernels. These, especially of the *helix pomatia* and the *limax rufus*, are found, on examination under the simple microscope, which the author prefers to the compound one, to consist of agglomerated globular cells, on the sides of which are seen a great quantity of globular or ovoid corpuscles (fig. 20. of the work). These last are evidently small cells, filled with a semi-transparent medullary or nervous matter of a distinct white colour. The globular cells to which these are attached likewise contain a nervous medullary substance which, as far as we can judge by the microscope, is of a grayish colour and semi-transparent. Here we have an analogous distinction to that met with in the gray and white matters of the brain of vertebral animals.

The nerves of the *helix pomatia* and *grisea* present externally a cellular tunic tolerably thick and semitransparent: the agglomerated cells of which it is composed are globular and contain a diaphanous and colourless fluid, and the sides of these cells contain corpuscles also diaphanous (fig. 21). In the centre of the canal formed by this cellular envelope is the nerve properly so called (the tissue of which is represented in *b*, fig. 21). It is composed of an immense quantity of nervous corpuscles of very minute size, adherent to two sets of fibres, the one longitudinal and larger, the other of extreme tenuity irregularly distributed in the spaces between the preceding. It is the nerve proper which alone enters into the interior of the organs; the cellular envelope is contiguous with an analogous one investing all the organs.

The nerves of the frog seem to be composed of transparent filaments, surrounded by nervous corpuscles, an arrangement very nearly identical with that just designated in the nerves of the *helix pomatia;* and not dissimilar to what we see in vegetables, in which globular corpuscles cover tubular cylinders.

The brain of the frog is entirely composed of an agglomeration of nervous corpuscles similar to those of the nerves. The only difference is in the proportion of the organic elements.

Here the author allows himself the following inductions. Since the brain, an organ peculiarly destined for the production of nervous power, is composed of nervous corpuscles; and the nerves, specially intended for the transmission of the nervous power or nervimotion, are entirely composed of nervous fibres, we are entitled to regard the nervous corpuscles as the generating organs of the nervous power, and the nervous fibres as fitted for its transmission. And since in vegetables we have seen that nervimotion is transmitted by the medium of the sap, we may infer that the *nervous* fibres of animals are tubes filled with a peculiar fluid by which nervimotion is accomplished.

Polypi have no nerves properly so called, yet they manifest by their movements the influence of external agents over them. This apparent contradiction is explained away by the author, who avers that in their transparent and apparently homogeneous pulp, we can distinguish, by the aid of the microscope, a large quantity of granulations resembling completely the nervous corpuscles of other animals and still more of vegetables.

The attention of the author is next directed to the structure of muscles and their motility. The term *muscular fibre* ought, he thinks, to be restricted to the filiform organs of which the muscles are directly composed; while by muscular fibrils he would understand the filiform organ smaller than what is observed in the intimate tissue of the muscular fibres. The rectilinear assemblage of globular corpuscles in the intimate structure of muscular organs is called by him *articulated muscular corpuscles*. All this is very minute, but not we think very readily understood. The muscular fibre is, he says, seen in its greatest simplicity of organization in some of the inferior animals, such as the craw-fish. On separating by means of a needle, the muscular fibres of the tail of this animal, and then subjecting them to the microscope, he found that the tissue consists of transparent fibrils arranged longitudinally, and in the intervals of which are numerous transparent globules, designated by him as *muscular corpuscles*. These are filled with a diaphanous fluid and interposed between the fibrils and applied to their surface, though their adherence is not very close, since some fibrils are entirely destitute of them.

The heart of inferior animals has no muscular fibres properly so called, but only fibrils and muscular corpuscles. In that of the lobster, the arrangement by *articulated muscular corpuscles* prevails. The heart of the frog, different from the other muscles of this animal, is also destitute of proper muscular fibres.

After having studied the intimate structure of the muscular tissue, the next point is to determine the mechanism of its motion. For this purpose Dr DUTROCHET selected the muscular fibres of certain insects, such as the horn beetle (*lucanus cervus*), which are completely isolated from each other. He discovered, however, that the contractile movement of the fibre depends on an internal mechanism, which it is impossible to see on account of their want of transparency. He determined, therefore, to direct his inquiries to the muscular organs which have no *fibres*, but the tissue of which regarded in its entire state is composed like the muscular fibres properly so called. This is the arrangement in the heart of the batrachia and gasteropodes mollusca. As the results of some of his experiments we may state the following. The contraction of a muscle by acids is to be regarded as a true vital process, and not the effect of mere corrugation. The muscular fibres of the thigh of a frog being placed in water and examined by a microscope were seen to be curved and twisted on one another like so many small worms. This last kind of action is the result of a peculiar vital property of the fibre, since for its production there was neither *sensation* to determine the movement nor *volition* to execute it. The tendency of the fibre to change in the relative position of its integral parts is by a movement on one side by which it becomes concave, and there results *incurvation*. If acids provoke the contraction or incurvation of the fibre, alkalies on the other hand bring it back to its first position. This alternation of incurvation and straightening is seen to take place under the influence of vitality alone. Contraction in the corpuscular muscular tissue consists in a *sinuous incurvation;* by which we presume the author means an alternation of concave and convex. In other cases there seemed to be merely a closer approximation or condensing of the muscular corpuscles without any turn or curve. The shortening then of the muscular tissue which constitutes contraction depends on a double cause, viz. corpuscular condensation, and the folding or sinuous incurvation of the tissue. Contraction and coagulation are merely different degrees of one and the same phenomenon. Acids both produce coagulation and give

rise to contraction; alkalies produce relaxation of muscles and restore fluidity after coagulation.

Animal irritability and *vegetable irritability* are two phenomena essentially identical; both depending on the *incurvability* of their organic tissue, or of the vital faculty which it possesses of being curved and maintained in this state of curvature by its elastic character. In vegetables the incurvation is for the most part *simple*, that is of a single curve; whilst generally in animals it is sinuous. We are not to restrict incurvation to those vegetables called *irritable*, such as the sensitive plant, but to extend it to all which by their movements assume the positions of *waking* and *sleeping*, and which by tendrils attach themselves to the nearest support.

The knowledge acquired of the cause of this incurvation in animals enabled Dr Dutrochet to discover the origin of the phenomenon in vegetables. We have just seen that the muscular tissue is composed of agglomerated vesicular corpuscles, sometimes in linear order and at other times distributed without method, and which are, after being rendered slightly opake by acids, dissolved in them, a distinction this between them and the nervous corpuscles which are insoluble in such menstrua. Now it will be remembered that on examination of the articulation or *bourrelet* of the sensitive plant, there was seen a great number of globular cells in a line, which were filled with a fluid concrescible by cold nitric acid but soluble in hot. These globules are true *muscular corpuscles* larger than those of animals, but resembling them in their linear arrangement and chemical composition.

We shall postpone for the present the analysis of the remainder of the last and concluding section on muscular contraction and the coagulation of the blood, in order to connect the author's views with the observations and experiments on the same subject by Messrs Prevost and Dumas. The pages yet allowed to us for this article will be taken up by a succinct notice of the second work of Dr Dutrochet *on the immediate agent of vital movement*.

His first topics of inquiry are into the direction of the sap in plants and the cause of its progression. It is customary to speak of the ligneous or woody fibres as the part by which the ascending sap is carried; but the author, after pointing out the vagueness of this expression, shows us that it is by the lymphatic or corpusculiferous tubes of the central ligneous portion that the process is performed: the closters have no share in it. The lymphatic vessels are never

obstructed or closed up in the hardest and oldest layers of the wood, or what the author calls *duramen*, to distinguish it from the alburnum, or sap wood. The lymphatic vessels of this latter transmit the sap with equal facility as those of the duramen. The cortical system of the plant destitute as it is of corpusculiferous or lymphatic vessels does not participate in this function.

The tracheæ, as was observed in the first work noticed in this article, are the vessels in direct functional connexion with the leaves, in which they are found in large numbers. Knowing then that the leaves are in a measure the lungs of the plant, we are allowed to believe that the fluid vivified in them is carried by the tracheæ into the interior of the stalk or trunk; for these vessels are seen to extend from the leaves to the medullary sheath of the young branch which bears them.

The leaves, flowers, and fruits, are the parts to which the ascending sap is definitively conveyed. Here the greater part of this fluid escapes by transpiration into the atmosphere, in which it is dissolved. A portion submitted to organic elaboration is converted into a nutritive juice. The leaves are more especially charged with this last important function, and hence if they be destroyed there is a cessation of nutritive action in the vegetable, as well in the growth of the stalk or stem as in the development of the fruit. The elaborated sap being formed in the leaves must then take a descending direction—a fact proved by a very familiar experiment. If we remove a ring of the bark from a branch of a tree, the part directly below the denuded portion ceases to increase in diameter, whilst that above the ring receives an augmented growth owing to the forced stasis of the nutritive fluid, the tendency of which to descend is manifested by the projecting circle at the upper part of the annular decortication. The increased nutrition of the fruit in the branch above is additional confirmation of this fact. It was at one time believed, as an inference from this experiment, that the bark was the only part through which the descending sap was conveyed. Mr KNIGHT, however, in a paper published in the Philosophical Transactions in 1806, suggests the probability of the occasional or accidental descent of the sap in the alburnum, when such a distribution is necessary for the preservation of the plant. Dr DUTROCHET gives us a more physiological and consistent explanation of the phenomenon, by showing that although the lymphatic vessels, those for the ascending sap, prevail in the greatest proportion in the alburnum, yet we

also meet with closters in its substance, which certainly contain elaborated sap. It is not then necessary for us to admit with Mr KNIGHT the *inverted* action of the vessels of the alburnum; for Dr DUTROCHET has shown the ligneous tissue of the central system of the plant can of itself carry on the downward transmission of the sap. This, however, is most readily and naturally accomplished when the wood is clothed with bark.

After all we must not regard the elaborated sap as always taking a *descending* course. It becomes *ascending* in the peduncles of the fruit, and for the elongation of the stem or trunk and development of the buds. To Mr KNIGHT we are indebted for a knowledge of the fact, that the ascending sap, or the lymphatic fluid, dissolves a certain quantity of the elaborated juice which had been preserved in the wood during the winter. This last was contained according to Dr D. in the closters.

In reference to the functions of the medulla or pith of the plant, the author thinks that, composed as it is so much of globular corpuscles, which he regards as nervous bodies, it performs the part of giving additional life and vitality to the buds and young branches. He admits also, to a certain extent, the opinion of M. DUPETIT—THOUARS, that the medulla of the older or mother branches contains in its cells nutritive matter in reserve for the other and younger parts of the plant, especially the buds, which he calls *fixed embryos*.

It follows from the facts stated in the work, that the lymphatic sap and elaborated sap have each of them special organs of transmission, and by these they tend to a general diffusion through the plant. If the lymphatic be for the most part ascending, this is owing to its being chiefly derived from the soil; and if the elaborated be chiefly descending, we find the cause in its originating exclusively from the aerial part of the plant: but at times each of these two kinds of sap may take an inverted course. *There is not, then properly speaking, a circulation in vegetables;* that is to say there is no return of the mass of the fluid to the point whence it set out; though in consequence of their different origins, radical and foliated, the two kinds of sap, ascending or lymphatic, and descending or elaborated, usually flow in opposite directions.

The effusion of the sap between the wood and bark in the dicotyledon plants, and the consequent formation of new layers of *alburnum* and *liber*, are accomplished, in the author's opinion, by the me-

dullary rays of the central or ligneous, and of the cortical or external system, which, meeting, pour out the two kinds of sap.

Connected with our inquiry into the course of the sap, is a knowledge of the formation of the tubes which serve as canals for this fluid. The origin of the lymphatic vessels, including the *porous tubes*, or *divided tracheæ*, is evidently cellular, the cavities of the cells having no direct communication with each other. The continuous lymphatic canal, subsequently formed, only becomes so by the disappearance of the transverse partitions constituting the cells. This explains the difference in the effects of incisions in the old wood of a vine, and in the young branches in the spring. The discharge from the first is copious and strong, that from the latter small and feeble, on account of the *vis a tergo*, by which the sap is driven out of the wood, being obstructed by the cellular arrangement in the new portion.

Independently of this essential organic element of a cell, vegetables have no other but the tracheal, different in its origin and nature.

In the second chapter, headed '*Trepidation*,' the author investigates the phenomenon which was supposed by a Prussian botanist, M. Schultz, to constitute a true circulation of yellow juice in the great celandine (*chelidonium majus*, *L.*). Dr Dutrochet at first supposed the whole to be an optical illusion, but a repetition of his experiments satisfied him of the reality of a molecular movement in the ribs of the leaves of the great celandine, which he qualifies by the term trepidation. He cannot, however, admit its being a true circulation; since, among other objections, he found it to continue with unabated rapidity for several days after the separation of the leaf from the plant, and even until the former was almost withered. Still trepidation is a vital movement, destroyed or suspended by a reduced temperature, as when the thermometer is near the freezing point. The author compares it to the molecular movement of the blood in animals immediately after their death, a phenomenon which he observed in the blood vessels of a mouse's ear, and in the mesentery of the same animal. That it is not a true circulation is evinced by the fact of there being no current; since, although the two extremities were cut there was no issue of fluid from either. We have little doubt but that these deceptive appearances misled Wilson Philip, and others, into a belief of what he calls capillary circulation in the mesentery of certain animals, after the removal of this part from the rest of the body.

The third chapter is occupied with investigating the causes of the movement of the sap. Of the hypotheses which have been at different times accredited, the author thinks it worth while to notice two only. The first supposes the rise of the sap to be the effect of the capillarity of the vegetable tissue; the second explains the phenomenon by the alleged contractile power of the vessels which thus propel the fluid onwards.

That the sap is driven forward by a strong propulsive movement was long ago shown by HALES, and has more recently been demonstrated in a conclusive manner by MIRBEL and CHEVREUL. The former, on adapting a tube filled with mercury to the branch of a vine, the anterior extremity of which had just been cut off, saw the sap take the place of the metal and raise it to the height of 33 and 38 inches above its primitive level. The two latter gentlemen in a similar experiment found the mercury to rise 29 inches; that is to say, as high as it is kept by the whole pressure of the atmosphere. If a vine branch, thus discharging sap so freely from its extremity, be cut off lower down and immersed in water, this fluid will be drawn up by the open vessels of the lower end, but no sap will escape from the upper one. Hence there would seem to be two causes operative in its rise; the first is an impulsion *à tergo;* the second is dependent on the action of the internal organs of the plant on the liquid which it absorbs.

It is with regret that we find ourselves compelled to pass over many interesting experiments and reasonings of the author on this subject, and must content ourselves with a notice of some of his leading positions. When the cut end of a vegetable or branch is immersed in water, this fluid is absorbed and distributed to all its parts, maintaining life and freshness in them. Observation teaches that the absorption, in this case by the stem, is proportioned to the evaporation from the leaves, the removal of which would be attended by the cessation of both functions. Light exerts a powerful influence over the respective quantities of absorbed and evaporated fluid; nor is it necessary that heat should be conjoined to produce this effect. Absorption is rather greater during the night,—evaporation during the day. The partial vacuity then of the vessels of the upper part of the plant by evaporation, is one of the determining causes of the absorption effected by those of the lower portion. Another inference is, that the capillarity of the vegetable cannot be the sole cause of the absorption of the water and its rise in the stem

of the plant, since this property does not vary, and we can see no reason why it should introduce more water during the night than is dissipated by evaporation, and why the contrary should be the case in the daytime. There is then evidently a vital action modified by the presence and absence of light, and destroyed by a too great desiccation of the plant and evaporation, not merely of the water it contains, but of its *organic fluids*. Moderate desiccation, as when a plant is slightly shrunk and drooping, enables it to absorb with increased avidity, and become even more turgid than before. One notable distinction therefore between a *dead* and *living* plant is, that, notwithstanding the vegetable tissue of the former may be as full of water as its capillarity requires, it is still far from being *turgid*, it is *flaccid;* whereas in the latter the water fills its capillary cavities to superabundance, and produces a state of general turgescence. We are, therefore, allowed to believe that the turgid state of the small hollow organs of a plant is the necessary condition for the rise of the sap by *affluxion* (*adfluxion*). By this term, the author means the flow of the sap towards a particular place where a cause operates to invite or draw it. Thus, if a branch be cut off and its lower extremity be immersed in water, it is only by *affluxion* that the water rises up through the stem to the leaves. But in a plant which is connected with the earth by means of roots, there is, independently of the movement of the sap by *affluxion*, a progression by *impulsion* the evident effect of a *vis a tergo*.

Inquiries into the nature of this second motive power led the author to the following discoveries. The moment in which the stalk of a vegetable was cut off close to the earth, was that in which the sap ceased to flow from the upper part which had been exposed by a transverse section of one of its branches. There can therefore be no cause of impulsion in the stalk or trunk, as the case may be. It was found after continued sections of the roots, that the sap still continued to flow from them, unless their capillary portion or the spongy terminations of the radicles were interested. This spongy body (spongiole) is really the organ of impulsion for the rise of the sap in vegetables, and it is, moreover, as proved by Bonnet, the special organ for the absorption of water.

Before attempting to determine in what the propulsive action of the spongy bodies of the radicle consists, the author takes a view of the structure of these parts. The spongy bodies of the vine observed in the spring are of a whitish colour, and of a delicate and tender

tissue, which is entirely of a corpusculiferous cellular nature. The central portion of it is articulated in a longitudinal direction and is continuous with the central system of the radicle, and its articulated cells are the elements of tubes likewise articulated, called, as the reader has already seen, *corpusculiferous* or *lymphatic vessels*, and which are destined exclusively for conducting the sap upwards. The cellular tissue external to this and forming a continuation of the cortical system of the radicle is irregular, very transparent, and covered with corpuscles of exceeding minuteness. There is formed every spring a new spongy body, whitish and delicate, issuing from the one of the year before, which last becomes a constituent part of the radicle. On the following year the cortical portion of this new formed radicle dies, so that the remaining central or ligneous part is smaller than the very termination or spongy body, the delicate cellular layer of which is more especially the organ of absorption.

The author next investigates the foundations of the two hypotheses which have been made to explain the state of pressure to which the sap is subjected in the lymphatic vessels of a plant. The first is that the air often mixed with the sap does by its expansion, and in proportion as it is formed, communicate an impulsion to the fluid. The second rests on the supposition of the hollow organs, which contain the sap, having a contractile power like that which the heart exercises on the blood of animals. The fact of air being mixed with the sap is admitted, but is, on the author's showing, incompetent to produce the effect in question. The contractility of the lymphatic vessels, plausible enough on first annunciation, is disproved by the following among other considerations. The fig tree abounding in a large quantity of milky juice might be supposed, so long as its branches are herbaceous, to give it out from a cut extremity by the contraction of its vessels; but when we find the juice poured out abundantly from the tissue hardened into wood, and even from the ligneous portion of the central system so resisting as to break with fracture and noise, we cannot for a moment suppose the expulsion of fluid to be performed by such a mechanism as vascular contraction.

We now approach a most important part of Dr DUTROCHET's work. It is the chapter entitled "*Observations and Experiments on the Cause and Effects of the Turgid State.*" The author found that there projected from the surface of a wound made by cutting off the tail of a small fish, which he preserved alive in a vessel of water, a production similar to a kind of aquatic moss with tolerably long

filaments, each of which was terminated by an enlargement very perceptible to the naked eye. Some of these transparent filaments, the enlargements of which resemble the capsules of vegetables, and terminate in a point, and are completely opake, were put in a watch crystal for more minute inspection. Dr D. soon saw some of these capsules expel through an opening at their point a great many globules. During this process the cavity of the capsule was emptied at its lower part alone, opposite to the point whence issued the globules, and the mass of which still filled the upper part of the capsular cavity and seemed pressed and strongly driven upwards by the accumulation of water in the inferior portion; hence the expulsion of the globules was evidently not due to any contraction of the capsules. The water seemed, says the author, by its introduction into the inferior part of the capsular cavity to perform the office of the piston of a syringe, for the driving up and expulsion, through the point of the capsule, of the collection of globules which had at first completely filled it. The globules were believed by him to be animalculæ, similar to those called by Bory de Saint Vincent, *zoocarpees*. He found, however, that on immersing pieces of any animal matter into the water in which the fish had been kept, that they were soon covered with a similar production as in the case of the wounded surface, and hence that this is not dependent on the vitality of the animal. Some days are required for the plant, since such it is, to acquire the maturity necessary for it to give rise to the emission of the globules, or as Dr D. believes them to be, seeds contained in the capsules. Regarding the water introduced into the inferior part of the capsular cavity as the evident mechanical instrument of the *vis a tergo*, by which the expulsion of the collection of globules is effected from the remainder of the cavity, he asked himself, whence comes this water, and what is the power by which it is driven into the interior of the capsule? But for his being able to observe with the naked eye, a similar phenomenon in the animal kingdom, he would probably have been content to have noted what we have just described, as an isolated and inexplicable fact. A small spermatic sac deposited in copulation by the male, is occasionally, if the animal be alarmed at the time, expelled from the female organ of the snail. These sacs are like small retorts, much curved and larger at their closed than open extremity. When placed in water they are gradually emptied of their sperm, which escapes with effort from the neck, while the water occupies the lower and largest portion.

Here, as in the former case, the accumulation of water in the lower part of the sac, through the sides of which it was introduced, acted evidently as a mechanical agent for the pressure or expulsion of the spermatic paste through the upper part or neck. All doubt respecting the nature of this expulsive force was removed by the author witnessing the issue of the last portion of the sperm from the sac with a current of water, very sensible by the repulsion which it exerted on the light bodies floating in it. The current became afterwards more feeble, and entirely ceased after the expiration of a minute. The sac or little retort thus emptied of its contents did not display any contraction of its sides nor any shrinking. To give still greater assurance of the correctness of the experiments, another sac was placed in water with its neck uppermost, so that the emission of the sperm could not be attributed to a simple flowing out after dilution in the surrounding liquid. Things passed in the same way as at first, except that rather more time was required for the entire completion of the process. It would seem then that water accumulated gradually in the interior of small organic cavities, becomes there a mechanical agent of impulsion, a true *vis a tergo* for the expulsion out of these small cavities of the substances which they formerly contained. To this *physico-organic* or *vital* action, the double effect of which is to render turgid the small hollow organs, and to produce an expulsion of the substances which they before contained, Dr Dutrochet has given the name of *endosmosis** (*endosmose*).

Once in the path of inquiry, the author went on multiplying his observations and corroborating the inferences from the former phenomena. The cœcum of a chicken, after being well washed and cleansed internally by frequent injections of pure water, was half filled with milk, and its open extremity tied with a ligature. It was then immersed in a vessel of rain water, its weight together with the contained milk being 196 grains. Twenty-four hours afterwards, it was withdrawn from the water, when it weighed 269 grains, having gained by immersion 73 grains of water introduced into its cavity. It was again placed in water which was renewed night and morning. After twelve hours the weight was increased to 313 grains and the cæcum was very turgid. From this time it

* From ἔνδον *inwardly*, and ωσμος *impulsion*.

began to lose weight and turgidness, and its emptying going on caused a shrinking of its sides. Thirty-six hours after the commencement of this diminution of weight the intestine only weighed 259 grains. The experiment was then terminated, the cœcum was opened, and the milk found curdled and putrid. The temperature during this time ranged from 74 to 79 degrees Fahrenheit. Having emptied and well cleansed the interior of the cœcum by injections of fresh water he half filled it anew with fresh milk, and placed it as before in water. After the lapse of twenty-one hours, he discovered an augmentation of weight equal to 21 grains. From this time, however, there was a rapid diminution. At the expiration of twenty-four hours more, the intestine was opened, and the milk was found to be decomposed and putrid.

Though as a general rule, there ought to be an organic fluid denser than water and possessed of peculiar chemical qualities, constituting a *healthy state* in a hollow organ, in order to give rise to endosmosis, yet even this is not absolutely essential. Rain water, introduced into the cavity of a cœcum in place of milk, will give rise to endosmosis, which is however suspended in all cases in which the contained fluid becomes putrid, or the organic membrane itself is similarly affected. Continuing his trials, the author found that endosmosis would go on, even though the hollow organ were completely empty; hence he infers, that it is an action performed by the tissue of the sides of the hollow organ itself. Nor does this depend on the particular superposition of the intestinal membranes. When the cœcum was turned inside out, the sac thus formed allowed of the introduction of water. But if an organic liquid, such as albumen, still denser than milk, be introduced into the cœcum, the quantity of water which passes through its sides will be even greater than in any of the former experiments.

A new phenomenon was next noticed by the author: when the endosmosis ceases in consequence of the putrefaction of the contained fluid, the water, in place of entering into the cavity as before, or even remaining there after its entrance, issued out and that with some rapidity. His suspicion, soon confirmed by experiment, led him to the admission of a new action opposed to the former one. Thus when the denser of the two fluids is in the cavity, the water is introduced by *endosmosis;* but if the fluid without be the denser, then the contained one is carried outwards by an inverse action de-

signated by the term *exosmosis** (*exosmose*). These two actions were uniformly connected with the chemical nature of the fluids employed, alkalies in the cavity always producing endosmosis, and acids exosmosis. The belief at this time entertained by the author, that the movements of the fluids depend on electrical currents, was fully confirmed by experiments. On taking a chicken's cœcum, and introducing the negative pole into its interior and placing the positive outside, so that the side of the intestine was the communication between the two poles, and then putting the galvanic pile in action, the cœcum being immersed in water, the cavity before empty now became turgid by the passage of water through its sides in the direction of the electric current, that is, from the zinc or least dense to the copper or most dense pole. The result was reversed by putting the positive pole within the cavity, and the negative outside, as in the case of the less dense fluid being in and the denser out.

Dr D. compares the hollow organs to Leyden jars with permeable sides; and as the current of fluid is always towards the negative pole, there will be endosmosis when their interior is in a state of negative electricity, and exosmosis when it is positively, and the exterior negatively electrified. Organic tissues are proved to be better adapted than inorganic porous bodies for the formation of an electrical current, which gives impulse to the water. Farther experiments satisfied the author that the two processes of endosmosis and exosmosis were constantly going on with variously proportionate energy at the same time. The intensity of endosmosis is increased by an elevated temperature.

Applying now with the author the above described phenomena to vegetable and animal statics, that is to the course of the sap in plants, and of the lymph, chyle, and blood in animals, we shall find ourselves with a more extended horizon for observation than before. The distention of the sap vessels of a vegetable is due, our readers will remember, to a *turgid state*, dependent on a true vital action. Now the cause of this turgid state is no other than endosmosis, in virtue of which the water in contact with the spongy bodies of the radicles enters into their vesicles or cells, which contain a denser organic fluid. The water thus imbibed propels that precedingly introduced, and causes necessarily an upward movement of the sap

* From ἐξ *out of*, and ωσμος *impulsion*.

in the vessels, which it was shown were continuous with the articulated cellular tissue of the root. This continued progression by *impulsion* explains the pressure to which the ascending sap is exposed in the tubes of the vine. Another movement, also the result of endosmosis, is that of affluxion or pumping, which resides in the leaves. It has been already shown, that evaporation from the leaves invites the afflux of fresh fluids from beneath; but, for this process to be performed they must possess a certain degree of turgescence, that is, a certain amount of organic fluids, which implies the action of endosmosis. The leaves and spongy bodies exhibit then, in an inverse manner, the union of the two effects of endosmosis. From their combined operation result on one side the ascending, and on the other the descending course of the sap. The vessels themselves are for the most part inert in these operations; since, in addition to the facts already assigned, it has been found, that a liquid has ascended in the stalk of a plant which was entirely dead, the leaves alone preserving their vitality and causing the movement of affluxion.

Anticipating the remarks of the author on absorption in animals, we may regard it as performed by an action analogous to, and even identical with that by which the progression of the sap is accomplished. Both absorbents and sap vessels receive their fluid contents by filtration through spongy bodies; the membranes for the former and the capillary terminations of the radicles for the latter. The fluid in both cases passes from vesicle to vesicle by endosmosis, and while maintaining them in a state of turgescence in excess, it acts as an impelling power to the fluid in the tubes connected with the vesicles. It might at first be thought that the knots in certain classes of vegetables as the gramina, and the lymphatic and lacteal glands in animals, would impede the course of the fluids in their respective systems of vessels. A little reflection satisfies us that the reverse holds good. The knots have agglomerated vesicles, each of which exerts its particular endosmosis, rendering them ends of affluxion and origins of impulsion. The glands are furnished with a capillary tissue, the endosmosis of which produces the afflux of fluid contained in the *vasa afferentia*, and at the same time the expulsion of the fluids precedingly introduced, and hence an impulse *à tergo* for the *vasa efferentia*. These bodies are then, in fact, organs of afflux for the fluid below and of impulse for that above; they constitute motor organs for the fluid contained in the vessels.

Observation shows that there are *elective absorptions*. Thus in the alimentary canal, the chyle alone is absorbed, though it be mixed with excrementitious or fecal matter; because the former produces endosmosis, whereas the latter has a tendency to cause, and does in fact cause exosmosis, or a secretion in place of absorption.

This greater density of the substance applied than the fluids of the animal economy, or its possessing certain chemical qualities, which we have seen may be equivalent to excess of density, will explain perhaps why very active medicines given in large doses often fail to produce any effect: they are not absorbed, or very slightly so, precisely on account of the largeness of their dose.

Exhalation, either partial or general, is of course the result of exosmosis, and according as this prevails over endosmosis, so will exhalation be superior to absorption, and *vice versa*.

Nutrition is regarded by the author as the result of endosmosis. Each vesicle entering into the composition of an organ has in its interior a fluid denser than the sap of a plant or the blood of an animal, or which is of such a chemical composition, that the nutritive circulating fluid is attracted from the vessels, and a part of it is introduced into the vesicle, increasing thereby its size and giving it growth. But, as already explained, the inward is not the only current, since electricity, the cause of the phenomenon, gives rise to two currents in opposite directions, and of unequal force; and as that of introduction or endosmosis is stronger, the vesicle or cell is always filled in excess and preserves its turgid state. The feeble exosmosis is in degree aided by the violent entrance of new fluids, which must in consequence expel some of the matters before introduced. What is said of one vesicle or cell applies to all, the union of which constitutes the organ.

Secretion may be regarded as nearly an analogous process. Each vesicle secretes its contained liquids; that is, it only allows molecules of a particular nature to permeate its sides.

The sanguiferous system in animals or its minuter ramifications, keep up a kind of *irrigation* of the organs, and carry to the alimentary vesicles the new organic materials, which are received by a kind of infiltration, and not, as generally supposed, by vascular orifices. But whilst the vesicles thus receive by endosmosis new molecules from the blood, they expel by exosmosis others which are carried into the general current.

The renewal of parts by absorption, and exhalation and secretion,

constituting nutrition, takes place in the contained substances of the vesicles—the changes of composition and decomposition are in the *contained* not *containing* parts. If the latter were renewed like the former, it is probable that death from old age would never take place, for the being would never become old.

The author has some very interesting observations on the circulation of the blood in animals, and on inflammation, many of the phenomena of which are explicable on the principles before laid down. The sanguiferous system ought, he contends, to be regarded in its entireness as a cavity without issue, admitting of neither the entrance nor exit of any matters except by infiltration. Arterial extremities and venous radicals are physiological fables. The complete continuity of arteries and veins is visible through the microscope, in young salamanders. As regard the motive powers of the circulation, we must admit in the case just cited that the impulse of the heart is sufficient to communicate motion to both the arterial and venous blood. It was from having studied the circulation chiefly in reptiles, that SPALLANZANI was led to the belief of the paramount agency of the heart to the progression of the venous blood. But when the arteries are subdivided into innumerable capillary ramifications before their termination in veins, the impulse of the heart becomes gradually insensible, and the blood is moved under the influence of a new power. The common opinion of there being a contraction in the capillaries, and of this being one of the motive powers of the circulation is purely hypothetical. It would presume a *diastole* and *systole* similar to that of the heart. Dr D. has paid great attention, by means of the microscope, to the capillary circulation, but he could never perceive the least movement of contraction or dilatation in the capillary coats. He admits their elastic power, by which they react on the blood which distends them, but this is very different from true contraction. He thinks that the explanation of the course of the venous blood being caused by atmospheric pressure and respiratory movements, as taught by Dr BARRY, can only be an accessary one peculiar to mammifera and birds, which alone form a vacuum in breathing. It is by the action of endosmosis that the blood receives a fresh impulse in the capillaries. The blood of the arteries is *drawn* into their capillary ramifications, and hence the reason of the emptiness of the arteries after death when the heart is no longer active. The blood of the veins receives in the capillary ramifications an impulse, the cause of which has, until the present

time, been vainly sought for by physiologists. This cause, says Dr D. is evidently to be found in the affluxion of the fluids which drive forward, by replacing them, the fluids before existing in the capillary cavities.

As there are no vesicles or cells in the capillaries between the arteries and veins, we could have wished that the author had specified the manner in which endosmosis takes place in the first mentioned system of vessels, between the blood in which and that in the arteries he has not pointed out any difference in density or chemical properties, conditions these for the support of the turgid state and the movement of affluxion. He seems to have forgotten that from an artery to a vein there is a continuous tube, which can not, as far as he has yet shown us, be the seat of either endosmosis or exosmosis.

Inflammation he regards as the exaggeration or morbid increase of the physico-organic action so often mentioned: it is he thinks a *hyperendosmosis*, a name which he also applies, though we fear not very correctly, to the turgescence of the erectile tissues. Erectile hyperendosmosis has indeed, he tells us, but one occasional cause, viz. nervous influence, whilst morbid hyperendosmosis depends on numerous occasional causes. One of the most common of the latter is the introduction into the organic tissues of a foreign body. This reminds us in a striking manner of what has been already expressed as follows: *Whenever a substance denser than the fluid which surrounds it, is found in the organic cavities, it becomes a determining cause of endosmosis.* We see now why foreign bodies denser than the blood produce hyperendosmosis or inflammation of the internal parts into which they have been introduced. The passage on the other hand of substances less dense than the blood into the tissue of the organs, so far from causing inflammation, will diminish its intensity, by diminishing the activity of endosmosis. Hence we know that the introduction of water into the animal frame is one of the most efficacious means for removing inflammation. In this way watery cataplasms on inflamed parts, bathing, and abundant aqueous drinks are so useful.

Water by being largely introduced has the double effect of diminishing the density of the fluids producing hyperendosmosis, and of replacing those which it expels by its constant introduction. The more the blood, the fluid external to the vesicles, is diluted, the more rapid will be the first action of endosmosis, but the more prompt also

will be the renewal of the contents of the vesicles and of course the cessation of the hyperendosmosis. What was said of nutrition applies to the morbid state now under consideration; the changes are brought about in the *contained* matters,—the *containing* parts being foreign to the inflammation. It would seem then to be an alteration of the fluids which constitutes the diseases by hyperendosmosis; and accordingly it is by the fluids that contagious diseases are produced.

The part or organ in a state of hyperendosmosis is in a *turgid state*, and draws the fluids in abundance to it. The arteries are augmented in calibre and conduct the blood, directed to the inflamed spot, by *affluxion;* the veins coming from it are also dilated under the impulse of the blood, now sent to them from the part in greater abundance and with more force than usual. Thus we may consider an inflamed organ as at once the *object of affluxion* and the *origin of impulsion* for the blood. It is moreover, owing to the extension of the action of endosmosis, an organ of revulsion or derivation from other parts, which abandon a certain portion of their fluids. From this we learn the propriety of provoking an artificial hyperendosmosis, which shall be stronger if possible than the one primarily induced in a vital organ. In this way blisters and sometimes purgatives act. Leeching and cupping also operate by producing an affluxion in the part to which they are applied; because the vacuum which they produce tends to be filled by the endosmosis of the evacuated parts.

The author, after adverting to the empirical manner of treating inflammation and the necessity of taking physiology as our guide in medicine, lays down, according to his theory, the various means of combating morbid hyperendosmosis. Most of these have no claims to novelty, such as cupping, leeching, general bleeding, blisters, and watery drinks. The two first may relieve either by a direct evacuation of the altered fluids, if they are applied immediately over the part inflamed, or by derivation, if they are applied to a part adjoining, and there produce an affluxion. Theory here points out an additional therapeutical means, hitherto used very empirically. It consists in causing to be introduced by absorption, substances which, from their chemical nature, are calculated to produce a more energetic hyperendosmosis and the expulsion of the offending matter, that is, a renewal of the contents of the organic vesicles. In this way, Dr D. supposes, that mercury cures syphilis,—purgatives, dysen-

tery,—vesication, erysipelas; that is to say, we substitute a cause of hyperendosmosis, comparatively safe, for one fraught with danger, as is the morbid cause.

The intensity of hyperendosmosis may be diminished by the introduction into the animal economy of certain agents capable of producing exosmosis. It is probably in this way that acids are serviceable in inflammation. Nothing is less suited, in Dr D.'s opinion, to the relief of this morbid state than the free ingestion of drinks, of gummy and extractive matters, or of a saccharine nature. If emollient cataplasms have a salutary effect when applied to inflamed parts, it is owing either to the water which they furnish for absorption, or to the exosmosis to which they give rise in virtue of their superior density. A poultice of flaxseed is well calculated to produce this latter effect, and ought consequently to determine towards the surface an electric current by which the fluids are directed from within outwards, whence will result the depletion of the hyperendosmosed part. This theory would seem to indicate on certain occasions the employment of baths made of fluids denser than those entering into the composition of our organs. Then would the skin exhale abundantly in place of absorbing, which last is the case where the body is immersed in pure water, or a liquid of the like inferior density.

Here we close our task, in which we have endeavoured, and we hope not without success, to give a succinct and unbroken narrative of the novel experiments and ingenious views of Dr Dutrochet, as contained in his two works, on The Intimate Structure of Animals and Vegetables, and on The Immediate Agent of Vital Movement. We do not think it necessary to indulge in a laudatory strain respecting the merits of these productions: the lively interest we have experienced in their perusal is conclusive of our own feelings, and we are very sure that the reader of this review will be inclined to pay a similar practical eulogy to their meritorious and gifted author.

ARTICLE X.—*The Life of* EDWARD JENNER, M.D. LL.D. F.R.S. *Physician Extraordinary to the King, &c. &c. With Illustrations of his Doctrines and Selections from his Correspondence.* By JOHN BARON, M.D. F.R.S.

At the present moment, a good biographical memoir of the great discoverer of vaccination is most welcome. When there are found some, even of the ardent and earliest friends of this invaluable prophylactic, in doubt as to its real utility, it may be well to direct our attention once more to the history of its initial course. Without a present reference to the long and patient examination of the facts which triumphed over an able and well organized opposition at that time, we feel, in the perusal of the admirable portraiture of JENNER, drawn by his literate and intimate friend, a new confidence in the discovery, founded on the character of that acute, cautious and philosophic mind from which it emanated.

Every one who has read the sketches by Boswell must lament, that the biographer of "The Vaccinator" did not, like the delineator of Johnson, introduce us more frequently and fully into the recesses of the head and heart of JENNER, as they lay unfolded in the bosom of domestic life. Eminently a social being, his fine example should have been more amply developed; for we have too many incitements to the pursuit of public, ostentatious, and often unsatisfying virtues, whilst we need every inducement to the cultivation of those delightful, minor moral excellencies, that play around the soul in the seclusion of home, and which, leaving behind no satiety, and stimulating no vanity, are the sweetest and purest of human enjoyments. An intimate acquaintance, continued for fifteen years, together with the possession of the whole of the notes and correspondence of JENNER, should have afforded us a treat of the kind we speak of; but as it is, we are obliged to Dr BARON for what he has done, and hope that the pleasure received by us in the perusal of his memoir, will be felt by every one who reads it.

EDWARD JENNER was born at Berkeley in Gloucestershire, G. B. in 1749, and being the son of a respectable clergyman, received a sound education. In his childhood, he evinced that partiality for the study of natural history which so remarkably characterized his maturer years. The study of nature usually directs the attention of youth to the profession of medicine, and JENNER, following his bent and having completed his scholastic education, was instructed

in the elements of surgery and pharmacy by Mr Ludlow, of Sodbury, near Bristol.

Attracted by the fame of JOHN HUNTER, JENNER became, at the age of twenty-one, his pupil and an inmate of his family. An acquaintance thus commenced, was matured into a solid friendship which lasted until the death of Mr HUNTER. An uninterrupted epistolary correspondence was continued between them, until the closing period of Mr HUNTER's life. Nearly all the letters of Mr HUNTER are preserved, and many of them published in the work of Dr BARON. HUNTER took no care of those of JENNER, and they are probably irrecoverably lost.

On the return of Captain Cook in 1771, JENNER, then a pupil of HUNTER, was employed to arrange and prepare most of the valuable specimens of natural history, collected by SIR JOSEPH BANKS. This duty led to the offer of the situation of naturalist to the next expedition which sailed in 1772. Having previously resolved to enter upon professional duty in his native home, he refused an offer particularly tempting to one of his taste and pursuits. At Berkeley, the toils of his vocation were sweetened by the elegant pursuits of natural history. His memoir on the cuckoo, one of the finest offerings to the science of ornithology, excited a greater sensation in England than any other work of that science in that age. Truth combined with novelty in a curious manner in this memoir. The cuckoo deposites its eggs in the nests of other birds, leaving its offspring to the care of foster parents. An instinct, curious on account of its singleness, teaches the young cuckoo to force from the nest the true offspring of the foster bird: whilst the latter is occasionally an unconcerned spectator of the destructive extrusion of its own unfledged flesh and blood. The paper detailing these facts was read before the Royal Society in 1788, and is contained in the "Transactions" of that year. In this year he was united in marriage to Miss Catharine Kingscote, a lady in every respect fitted to adorn and cheer the mansion of a man of taste and talent. Some years before, JENNER had been deeply disappointed in love, but whether Miss Kingscote or another had caused his distress does not appear. His disappointment excited a very characteristic expression of sympathy from JOHN HUNTER.

"I can easily conceive how you must feel; for you have two passions to cope with, viz. that of being disappointed in love, and that of being defeated; but both will wear out, perhaps the *first soonest*.

I own I was glad, when I heard that you were married to a woman of fortune; but let her go, never mind her, I shall employ you with hedgehogs, &c."

In 1792, wishing for exemption from a very fatiguing department of his profession, JENNER purchased a degree in medicine from St Andrews.

On the 14th of May 1796, a boy named James Phipps was inoculated with virus taken from the hand of a milkmaid, who had been infected by handling the diseased udders of her master's cows. This operation, the first *well attested* instance of the *intentional* production of a disease familiarly denominated cow-pox, was performed by Dr JENNER for the purpose of testing the truth of the *popular* opinion of the antivariolous powers of the vaccine disease. In a letter to his old and faithful friend EDWARD GARDNER, dated July 19th 1796, he thus expresses himself.

"You will be gratified in hearing that I have at length accomplished, *what I have been so long waiting for*, the passing of the vaccine virus from one human being to another by the ordinary mode of inoculation.

"A boy named James Phipps, &c.....But now listen to the most delightful part of my story. The boy has since been inoculated for the small pox, which, as I ventured to predict, produced no effect. I shall now pursue my experiments with redoubled ardour."

It was in the spring of 1798 that he was again enabled to renew his experiments; for the disease had, until then, disappeared from the dairies. Seven inoculations were effected, one only of which failed. The failure took place in his own child, who was variolated afterwards to secure him from the danger of neighbouring small pox.

Armed with such conclusive experiments, and fortified with many cases, where protection from small pox was afforded by the accidental occurrence of *vaccinia*, Dr JENNER, after mature reflection, and frequent consultation with his friends, published his far-famed "Inquiry," and dedicated it to his friend, the celebrated Dr PARRY of Bath.

Prior to this momentous event, he, in April 1798, visited London, for the purpose of repeating his experiments before his medical friends in the metropolis. Who does not feel a difficulty in believing that a man of JENNER's high character, and known moral

worth, should have spent three whole months in London without being able to find one person willing to submit to an operation, the usefulness of which had been so amply attested.

One eminent practitioner, Mr CLINE, perhaps only partially moved by the statements of JENNER, deemed it necessary to resort to a kind of artifice to satisfy himself. Having under his care a case of disease of the hip for which issues were esteemed proper, he inserted some vaccine virus left him by JENNER, with a view to excite inflammation and form an ulcer. The subsequent ineffectual insertion of small pox matter brought complete conviction to the mind of Mr CLINE, and he thus writes to Dr JENNER under date of 2d August 1798. "I think the substituting of cow-pox poison for the small pox promises to be one of the greatest improvements that has ever been made in medicine." The experiment of Mr CLINE created a strong sensation in London. That gentleman endeavoured to propagate the infection but failed: and no farther experiments were made in London until the 20th of January 1799, when the virus was found in a dairy of the metropolis, and the practice of vaccination began to be fashionable in England.

In May 1799 Dr DE CARRO of Vienna vaccinated the child of a medical friend and soon after his own children. These were the first cases produced in continental Europe. Before the end of January 1801, fifteen hundred persons had been successfully vaccinated in Geneva, the native city of DE CARRO. To this gentleman's humanity Italy, Poland, Russia, Turkey, Greece, Persia, and British India stand indebted for the early introduction of the vaccine virus. In June 1802, the virus, in a good condition, reached the Company's establishment at Bombay; whence it soon spread over India.

It may readily be supposed that our shrewd and intelligent countrymen would be roused at the extraordinary and *useful* discovery of JENNER. On the 12th of March 1799, Dr WATERHOUSE of Boston gave to the American public a short account of the cow-pox; and his paper, published in the Columbian Sentinel, was headed "*Something curious in the medical line.*"

Shortly afterwards, with matter received from Dr HAYGARTH of Bath, Dr WATERHOUSE successfully vaccinated six of his own children; and, by a subsequent attempt at variolation, thoroughly satisfied himself of the prophylactic power of the new disease. It is to the credit of American physicians, that although, from the ignorance and cupidity of vaccinators, many errors were fallen into, yet no seri-

ous *public* opposition was made to the reception of the doctrine and practice of JENNER. President Adams gave early countenance to vaccination, and Mr Jefferson, with his sons-in-law, vaccinated nearly two hundred persons in his family and neighbourhood. Nearly two years after his first annunciation of this discovery to the American public, Dr WATERHOUSE writes thus to Dr JENNER. "24th April 1801. Could you believe that not a single case of the cow pox inoculation has yet occurred in Philadelphia? A young physician applied to me a few days since, from that city, for the infection. It seems that the leading physician there pronounces it too *beastly* and indelicate for polished society." On the 30th May 1801, he writes thus. "The inoculation finds no promoters in Philadelphia. I have had many letters lately on the subject from Virginia, &c." On the 5th November 1801, he says, "Had I not a kind of apostolic zeal, I should at times feel a little discouraged. The natives of America are skilful in bush-fighting." In another letter to JENNER dated April 8th 1802, he informs him, that Dr RUSH of Philadelphia "has come out full and strong in praise of the new inoculation, and has sent me a copy of an eloquent lecture on the blessings of the Jennerian discovery."

In December 1801, the discovery extended, partially at least, its benefits to the Indians of some North American tribes.

It is to be regretted that in the history of the progressive extension of vaccine inoculation, Dr BARON should have passed over in entire silence the most interesting and untiring efforts for its introduction into China. If its *three hundred millions* of inhabitants now enjoy this inestimable charm against the most loathsome and destructive of sublunary plagues, the credit is due to one single individual. Cautious, crafty, jealous of foreigners, and contemptuous towards strangers, the Chinese heard of the new disease with decided incredulity. It was not Chinese; it was therefore valueless, or if of value, unsuited to Chinese institutions. By stealth and by purchase, some of the meanest of the beggars were inoculated. Gradually and at a heavy expense, a sufficient number were thus protected to afford an exemplification of the benefits of the practice.

Had any death followed immediately, from any cause whatever, any case of vaccination, the inoculator would have probably fallen a victim to the bloody and indiscriminating laws against murder, under which term even accidental homicide is included. Against such opposition and in defiance of such obstacles, did ALEXANDER

PEARSON, chief surgeon of the British East India Company's establishment in China, fully force on the empire of China the salutary vaccine prophylactic. It is to be hoped that Dr BARON, in asserting the honest claims of Dr JENNER, has not suffered the name of PEARSON to drive him into that kind of injustice, against which he so strenuously labours to defend his hero. From Canton, the practice of vaccination, gradually but slowly received, reached the capital, and is now in almost universal repute.

A succinct but satisfactory history of the discovery and mode of vaccination, written by PEARSON and accompanied by illustrative plates, was by Sir George Staunton translated into the Chinese language, and widely distributed. There is a copy of this curious work in the Philadelphia library.

Notwithstanding the great novelty of the specific antidote, the strangeness of its origin, the mistakes of its friends, the blunders and the malignant opposition of its enemies, vaccination, in little more than six years from the date of JENNER's first publication, had passed into general use in almost every country on the face of the globe.

At the period at which we now write, when the usefulness of the vaccine disease is universally admitted, and the human passions, roused by interest and vanity, are slumbering in the tombs of those whom they once directed, we may be permitted to recal the scene of contention in which this blessing to our race entered on its splendid career of mercy. The lesson is a good one, and it cannot wound those who are now beyond the reach of praise or censure. Dr BARON, in presenting such a lesson, is able also to plead the imperfection of any biographical sketch, which should not exhibit the calmness and dignity of his hero, under an opposition, at once bitter and ignorant, hurtful and unjust.

Among the enemies of the Jennerian practice, stood pre-eminent a few of that antiquated class of pretenders to philosophy, who abhor the "test by experiment," and venture to pass sentence on things easily tried, without the least regard to the facts of the case. MOSELY, whose work on tropical diseases displays great learning, with much credulity and abundant arrogance, distinguished himself as the leader of this class of opponents. He wrote, as expressed by Dr BARON, "with all the bitterness and prejudice that generally attend on ignorance." He predicted an alteration in the human form :

"*Semibovemque virum, semivirumque bovem.*"

In reply to such charges, Mr RING appealed to MOSELEY for an opinion as to the possible effects of beef-steaks, mutton-chops, and veal-cutlets: while FERMON tells him that, in his allegations against vaccination, "he had acted the part of the devil's advocate at a canonization, who was to say all the harm he could against the saint, in order that his life might be thoroughly scrutinized, and his merits appear the more conspicuous*."

The eminently successful progress of vaccination proves, that such men as MOSELEY and EHRMANN could but slightly retard the advancement of this great discovery; but while JENNER could not doubt the ultimate triumph of his antidote, he was made seriously to apprehend the loss of that fame and honour which were so justly his due. When his opponents could no longer conceal, either from themselves or others, the inestimable value of vaccination, they resolutely denied to JENNER the *credit* of the *discovery*.

Although from time to time hints against JENNER's claims were thrown out, and a vaccine institution was formed in London, in which he was to have no share, yet no direct and open opposition to his right to the discovery was made to any extent, until, after much labour and heavy expenditure, he offered a modest appeal to the generosity of his country. Before a committee of the House of Commons, appeared his old and subtle adversary Dr G. PEARSON, who endeavoured to show that vaccine inoculation was practised by other persons, before the publication of JENNER's "Inquiry." In a subsequent examination, he claimed for himself and Dr WOODVILLE the chief merit in the *establishment* of the vaccine inoculation. The reader has already seen the obstacles which JENNER had to surmount in obtaining favour for his new practice, even after he had made many successful experiments. When its value *was* perceived, and it had begun to heap honours on its promulger, all his toils, his persistency and his patience were forgotten, and England was ransacked for reports of cases of vaccination, which, but for his philosophy

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* "A learned divine of the church of England," says Dr BARON, "who preached a sermon against small pox inoculation, in London, 1722, announced it as no new art, inasmuch as Job, he asserted had been inoculated by the devil. EHRMANN of Frankfort took rather a bolder flight, and attempted to prove, from quotations of the prophetical parts of Scripture, and the writings of the fathers of the church, that the vaccine was nothing less than Antichrist."

and his courage, would have remained unheeded and unknown. These idle rumours were readily believed by those who had long refused credence to the well attested experiments of an honourable and scientific physician.

The extent of PEARSON and WOODVILLE's services consisted in poisoning, with variolous virus, the uncontaminated cow-pox matter of JENNER, and mistaking the modified small pox thus created for the vaccine disease itself. This capital blunder greatly injured the early progress of vaccination.

Before the year 1770, and while in the shop of his preceptor Mr LUDLOW, JENNER's attention was turned towards the popular opinion of the antivariolous powers of the cow-pox. To JOHN HUNTER he suggested it during his residence in his family, and, on his authority, HUNTER continued in each succeeding year to mention it to his class. PEARSON heard Mr HUNTER on this subject, and himself gave the intelligence annually to *his* classes. According to JENNER's own testimony, he conceived the idea of conveying the vaccine disease by inoculation in 1775, and he mentioned it to his friend Gardner in 1780. Of the popular opinion respecting the prophylactic virtues of cow-pox, JENNER often spoke, in the medical societies at Alveston and Rodborough, and urged the prosecution of inquiries respecting it. "All his efforts were however ineffectual; his brethren were acquainted with the rumour, but they looked upon it as one of those vague notions from which no accurate or valuable information could be gathered, especially as most of them had met with cases in which those who were supposed to have had cow-pox had subsequently been affected with small pox. These discouragements, as will be seen more at large hereafter, did not suppress the ardour of JENNER's mind. He often recurred to the subject in these meetings; at length, it became so distasteful to his companions, that I have many times heard him declare that they threatened to expel him, if he continued to harass them with so unprofitable a subject*."

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* The least pardonable denial of the merit of JENNER as a discoverer was that made in 1821 by M. HUSSON in the article on vaccination in the Dict. des Sci. Med. It appears that in 1781, a year after Dr JENNER had expressed to his friend GARDNER his desire to try vaccine inoculation, a protestant clergyman at Montpelier suggested the same idea to a physician from Bristol of the name of PEW, who then promised to mention it to his friend Dr JENNER, &c. M. HUS-

To JOHN HUNTER, JENNER was indebted for a disposition to experiment, so remarkable in that great surgeon and naturalist. In one of his letters to JENNER, who had attempted a theoretic solution of a difficulty, HUNTER writes thus. "I thank you for your experiment on the hedgehog; but why do you ask me a question by way of solving it? I think your solution is just; but why *think*,—why not try the experiment? Repeat the experiments on a hedgehog, and *they* will give you the solution."

In the true spirit of this sound philosophical injunction, JENNER pursued all his inquiries, and thus acquired much reputation in various walks of science, and finally overcame those obstacles, which for perhaps nearly one hundred years had prevented the general reception of cow-pox as a prophylactic, and confined the knowledge of the most valuable fact in medicine to a few dairy-farms in England.

So completely did he investigate this subject, that only one other person has been able to suggest any thing more on the subject. That person was Mr BRYCE of Edinburgh, who introduced the use of the crust for vaccinating, and published the curious fact that a vaccination made while a vaccine vesicle of the same person is in progress, will create a vesicle, which will run a more rapid course, and overtake the first, and then proceed along with it. This he proposed as a test of the true character of the disease, and of its having affected the whole system of the individual. The value of both suggestions is great. The use of the crust prevents the necessity of breaking the vesicle by which the regular progress of the protecting influence is left unimpeded or unaffected; while recent and most perplexing epidemics of a variolous nature enhance our esti-

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son had studied his subject too well to be unacquainted with the evidence of JENNER's earlier attention to the subject. It also appears that JENNER had no friend named PEW, and that the only medical man of that name in his county, although engaged in a correspondence on vaccination in 1804, did not allude to the pretensions or conversation of M. RABAUT. It will also be noticed that it was at least fifteen years after this supposed communication, that JENNER put his theory to the test of experiment; during which time the Frenchman and his discovery remained in obscurity. The *conception* however was not the merit of JENNER, any more than it was the merit of Fulton respecting steam-boats. But it was his glory to have given a useful career to his discovery, and to have rendered the whole world his debtor for the *practical* knowledge of a preventive of the worst of physical evils.

mation of every measure likely to give certainty to our judgment in vaccination.

There is nothing in all which Dr BARON shows us of the very estimable JENNER, with one single exception, which does not place him in a highly respectable and most amiable position. That exception would not here be noticed, were it not thought useful to expose the greatest medical evil, whenever and wherever we find it.

Immediately on the publication of his excellent work on cow-pox, Mr BRYCE sent a copy to JENNER, with a polite, modest, and highly complimentary letter. In it he gives JENNER the whole credit of the discovery and promulgation of *vaccinia*, and requests his opinion of his improvements. In his first answer, full of apologies *for its long delay*, JENNER merely says in reply to BRYCE's queries: "You have anticipated some few observations that I had noted down for my next number." Some time after he again addressed Mr BRYCE, and acknowledges the ingenuity of the "*test.*" "To all young vaccinators it cannot be too strongly enjoined. The *experienced* will determine from the character of the pustule." Here its chief value, as an evidence of a general impression, is overlooked. Again, "I put your crust into the hands of my friend RING, and he informed me yesterday that it had produced a good pustule. Experience now tells us that this is a good mode of sending the vaccine virus to distant parts." Here also the chief value of the suggestion is overlooked. JENNER lived to think more highly of BRYCE's crusts, and to enjoin the careful preservation of the integrity of the maturing vaccine vesicle.

The details of the private life of JENNER exhibit him in a most agreeable manner. Of the high character of his knowing and reflecting faculties, ample evidence is afforded in the history of his numerous scientific labours. In his profession, he stood in the foremost rank; and enjoyed the esteem and confidence of his medical brethren, and the whole community in which he resided. With all the accuracy and patience of HIPPOCRATES, he united much of the fire and fancy of AKENSIDE, the poetic playfulness and humour of COWPER, and the soft amiable sweetness of MEADE.—"The utmost vigilance of those who ignorantly assailed either his conduct or doctrines, has left no stain upon his name." In the height of a most pardonable exultation, he always felt his dependence on the Great Author of discoveries. To use his own words, "It is pleasant to

recollect that these reflections always ended in devout acknowledgments to that Being, from whom this and *all other* mercies flow."

"Knowing that good company and good discourse were the sinews of virtue, he promoted them on all occasions. He was especially fond of music, and was a member of a catch club that met at Cam. He could also play on the violin and flute, and he was in the habit of forming select musical parties, where he occasionally was a performer.

"I have seen him in his latter years, after his renown had filled the world, and after the many cares attendant on vaccination had often weighed heavy upon him, shake them entirely off. He would then take up a humourous strain and sing one of his own ballads with all the mirth and gaiety of his youthful days.

"He had a particular dislike to cards, both because they interfered with a much more instructive employment of time, and often led to evils of a much more serious nature."

Medical Literature.

ARTICLE XI.—*Biographical Notice of* SAMUEL EMLEN, M.D. *By* CHARLES D. MEIGS, M.D.

Died on the 17th of April 1828, in the 39th year of his age, SAMUEL EMLEN, JR, M.D. Secretary of the College of Physicians of Philadelphia, and one of the Physicians to the Pennsylvania Hospital.

This is the third time, since the establishment of our Journal, that we have been called upon to record the decease of worthy and valuable members of our profession in this city. EWING was taken from the midst of us, just at the moment when his talents and virtues had begun to render his name familiar to the public ear as a rising and successful physician; the venerable Doctor GRIFITTS, as the close of a long life of devotion to the humane duties of medicine had crowned him with reverence and popular respect; and now, again, the irreproachable EMLEN, having slowly surmounted the first difficulties in the way to professional reputation, is, by an inscrutable decree of the Divine Providence, snatched from his family, his friends, and the art, which he seemed born to honour and advance by his industry, abilities, and exemplary life and conversation.

We have been commanded by the Kappa Lambda Society, of which he was a valued member, and officer, to prepare a sketch of his life for this number of its Journal; and in obeying this command, we hope that our feelings of personal attachment to him may not lead us to make any false estimate of his many virtues, or to overrate his acknowledged abilities. We sincerely desire at least to say nothing more than the simple truth in regard to our deceased member.

Such is the nature of our calling, that few physicians, whose lives have been short of half a century, have been able to furnish conside-

rable materials for the pen of the biographer. BAGLIVI, SAUNDERS, BICHAT, and some others, furnish rare exceptions to the rule; and even their lives are rather to be read in the works they have left as bequests to posterity than in the events they witnessed, or the transactions in which they were personally engaged. The peaceful, quiet and unobtrusive tenor of even a good physician's life affords, for the most part, but little scope for details or description; since good sense, faithful discharge of duty, charitableness, inflexible integrity, christian piety, all that renders a man *integer vitæ scelerisque purus*, may be possessed in the highest degree without affording very striking features for such an article. What says the poet?

> Full many a gem of *purest ray serene*,
> The dark unfathom'd caves of ocean bear;
> Full many a flower is born to blush unseen,
> And waste its *sweetness* on the desert air.

But those gems that are concealed in the deep caves of the sea, and the modest flowers that blossom in desert places, are not less bright, or sweet, or admirable, because they are not seen of the world—and those men, whose excellent and rare worth might make them the admiration of the age, are not the less admirable, if, with a virtuous modesty or christian humility, they retire from the stark stare of the public, preferring to exercise in a quieter sphere their excellent virtues, until confirmed by time and experience, they with more confidence may claim the high places of honour and respect. Virtue, in their view, is not a meteor, to flash out brightly and straightway be seen no more; for bad men occasionally do good actions: but it is a steady and a shining light, whose beams are mild in the orient, and grow broader and brighter and more beneficent, until they attain a meridian perfection and excellency. Those men only who *pursue* wisdom, and grow daily in goodness, are entitled to our admiration and praise. If such persons do not become what is called great; it is because circumstances make men great, and not that great men create circumstances for themselves. Such genius and public virtue as are found to be common and almost trite in times of great political convulsions and revolutions, ought not to be considered as rare or uncommon among men; for multitudes of persons pass their lives in vile trades, or squander their time in humble pursuits, who only require favourable circumstances to enable them to advance science, adorn the arts, or fill the rolls of fame with the history of glorious actions: the same is true of physicians, whose greatness oftener depends on contingencies than on their own pre-

eminent qualifications. The occurrence of terrific epidemics, or fortunate appointments to public stations, are frequently the causes which lift men far above their equals in talent or worth.

After all it might be asked, what is it that makes men worthy of imitation when living, and of reverence and regret when dead? He only is admirable who begins life with unchangeable resolves to discharge his relative, social, and religious duties, and who, in the course of that life, brings constantly up to the mark in performance, what he had aimed at as the prize in promise. The common fault is that men go on by a sort of rule of chance-medley, have no fixed and predetermined objects or motives, and yielding to the impulse of events, are ever swaying up and down, and come therefore to nothing good. A man may begin with a general resolution that he will lead a moral life; but he is not half so apt to escape the snares of temptation, as he, who firmly determines to eradicate from his soul the particular seeds of pride, envy, malice, avarice, &c. The very definiteness of the plan ensures its fulfilment.

Cicero says of the wise man, that "amputata circumcisaque inanitate omni et errore, naturæ finibus contentus, sine aegritudine possit, et sine metu vivere:" to be restrained within the "naturæ finibus" is to possess moderation—it is to know duty and to do it.

In the death of Dr Emlen we have suffered the loss of a man who understood well, and discharged in a high degree, his professional, social, and religious obligations—who had forced his way by sheer merit, without an iota of false pretences or shrewd policy, into the public favour.

Dr Emlen was born in Chester county, state of Pennsylvania, on the 6th of March 1789. As springing from one of the oldest and most respectable families of the society of Friends, he received of course, in his early education, all the advantages which their strict example and sedulous inculcation of good morals could bestow. His education was chiefly English; but as it was carefully superintended, he laid in it a solid foundation of knowledge, on which he afterwards erected a considerable structure of various and available information. The flash and gewgaw of education were never very desirable nor pleasing in his eyes, inasmuch as he knew them to be unessentials in managing the solid and stern concerns of life; and herein he conformed to the practice of the religious body of which he was a member, who, though they despise not many of the elegant pursuits of literature, and often combine in a high degree the

agreeable with the useful, are more given to the latter than to the former. Dr EMLEN's acquirements were more solid than specious, and produced in him those excellent fruits which have caused his death to be so much regretted.

In the year 1808, having resolved to devote himself to the profession of medicine, he placed himself as house pupil with Dr PARRISH of this city, and, under his roof, and with his example constantly before him, made rapid progress in his studies, to which, by the testimony of his teacher, he absolutely devoted himself.

Under the roof of Dr PARRISH and as a member of his family, Dr EMLEN passed four years, during which having attended the lectures delivered in the University by the professors RUSH, WISTAR, BARTON, PHYSICK, JAMES and COXE, he graduated M.D., and in June 1812 embarked at New York for England.

Arrived at London in the month of July, he placed himself in the vicinity of one of the great hospitals, where he sedulously endeavoured to acquire the greatest amount of practical and surgical knowledge. Attendance on hospital practice, on lectures by the celebrated individuals whose reputation had attracted him thither, conversation with celebrated men, to the houses of many of whom he had free and familiar access, and visits to objects which interest the man of science or the philanthropist, kept his mind on the stretch; and he accumulated a large stock of information, of which he noted down the heads in his journal, which we have perused with great satisfaction, as affording evidence of the diligence with which he employed himself even at that period.

The declaration of war by the United States against Great Britain, which reached London soon after his arrival, placed no obstacles in the way of his studies while in the metropolis. The detention it occasioned gave him an opportunity, however, of making an extensive tour through England, Ireland, and Scotland, the history of which is detailed with considerable naiveté in his journal. At length the obstacles to his visit to Paris were removed, and after a residence of fourteen months in the island, he reached that city about the time of the Emperor's return from Leipzig.

His stay in London and his frequent access to the society of the most eminent physicians, surgeons and lecturers had increased his stock of knowledge, while the elegant society in which he moved, although it never abolished the gravity of his carriage, or the serious and sententious style of his conversation, imparted nevertheless to his

manners that urbane cast, which is far more estimable and trustworthy than the false and heartless elegance of mere fashionable intercourse. They were marked by the gentleness, self possession, and confidence which belong to the gentleman.

In Paris, though daily attracted by the extraordinary events of that wonderful period of history, Dr EMLEN continued to attend mainly to the objects of his visit. The battles fought in the vicinity filled the hospitals with soldiers suffering under every species of military accidents, which he carefully studied.

As we have no events of his history while in France, demanding a particular relation, we need here only state that after the surrender of the French capital he returned to London in June, from whence he proceeded to Holland, and came home in the corvette John Adams as the bearer of despatches to the Government, after an absence of nearly two years and a half.

Soon after his arrival he commenced the practice of physic, and was elected one of the physicians to the Philadelphia Dispensary; an excellent school of practice, through which most of the eminent practitioners here have passed.

In 1819 he resigned this station, in consequence of increasing occupations; soon after which he was elected to be one of the managers, and finally after the death of his revered friend Dr GRIFFITS became secretary to that charity.

During the year 1819, when the yellow fever prevailed along the water margin of the city, Dr EMLEN was secretary to the Board of Health, and made those observations of which the fruit is to be found in his valuable paper on yellow fever published in the last number of this Journal.

As member of the Board of Guardians of the Poor, as physician to the Magdalen Asylum, the Orphan Asylum, and the Friends' Asylum for the Insane, he established broadly and deeply the foundations of a reputation which tended daily to raise him in the public esteem.

He was an efficient and respected member of the Kappa Lambda Society; and the Journal of that Association is much indebted to him for the usefulness and reputation it has attained. He succeeded Dr GRIFFITS as secretary to the College of Physicians, and to his zeal is undoubtedly owing much of the renewed activity and efficiency which marks the present course of that institution.

In 1825 he was elected one of the physicians to the Pennsylvania

Hospital, an office to which he was annually re-elected, a sufficient proof of the assiduity and ability with which he discharged the functions of that honourable and very responsible situation.

This excellent man sat not down contented with the discharge of his merely professional duties. He had acquired very solemn impressions of the magnitude of the evils which the vice of drunkenness has brought on the country, and few persons, although much attention has been given to it by some of the foremost men of the time, had accumulated more of statistic knowledge on the point than himself. In the organization of the Pennsylvania Society for Discouraging the Use of Ardent Spirits, as well as in its administration as Manager, he took a very active and discreet part.

Dr Emlen's private business occupied a very large share of his time. It had augmented rapidly during the last few years of his life; so that, with his public and private affairs, he had little leisure for visits of ceremony, or for any waste of that time which in his eyes was so valuable.

We have said that a physician's life for the most part furnishes few materials for the biographer: and yet, could we trace step by step so good a man's walk; behold him as he carries into the haunts of sickness, pain, and despair, the healing influences of his function; see him at the bed side of the declining and dying, calling the careless or amazed senses to a just consideration of the duties of the creature towards the creator; could we feel each throb of that sympathizing heart, or sum up the numerous almsgivings of that ever open hand,—what more should we need of events, to grace his memory or make his history interesting? The mad ambition of a conqueror may drive his headlong squadrons from the Granicus to the Indus over prostrate rights and bleeding bodies—may gather trophies, and wear them; but in the eye of sober reason and reflection, such are not half so lovely, so good, so beneficial in their day, as the ceaseless and noiseless triumphs of a good physician, whose christianity adorns and at the same time is illustrated by a blameless life.

Dr Emlen was a christian: those who knew him will appreciate this praise. His religious diary, commenced in 1823, was continued up to the day preceding the invasion of his last illness, and contains a faithful, candid transcript of his feelings and views concerning the immortal hopes and desires that he experienced. It affords the evidence of that strained anxiety for improvement in morals, which he seems to have made a regular part of his plan, and of which he

never lost sight in his conduct or conversation. We ought to remark that, during his absence in Europe, he had been so much in the world, as to have omitted some degree of that rigid observance of *plainness* that marks the dress and manners of Friends; but, as his mind began to be more and more impressed with his religious obligations, he became more conformed to the practice of his society. His diary has an entry relating to the change he had effected in dress and demeanour, which was made for the purpose of enabling him, with less embarrassment or inconsistency, to live up to the requisitions of his conscience.

He quotes an observation, "we become christians more speedily by changing that which is within than that which is without;" and subjoins, that in order to enable him to restrain his conduct with less hesitation within the bounds of the cross, and feel as though he had no plea for appearing to act as a worldly man, he had assumed that plainness of style which he doubtless considered as customary and useful aids in the christian warfare.

In the year 1819, he married Beulah Valentine, who was like himself a member of the Friends' Society. In the tender relations which this union produced, he found the purest sources of happiness. To his children he bore an affection that might be called passionate. We presume to say that the fire of parental love glowed in his breast with redoubled intenseness, perhaps because of the habitual restraint under which he was accustomed to hold his passions: how lamentable must have seemed the stroke which divided him in this world from that care and watchfulness over his children, which appeared to be, for him, the best part of existence. Nevertheless, in committing his family, as he did, on his death-bed, to the providential care of his Maker, he seemed to have acquired a calmness and submission that permitted no murmuring word to escape his lips, nor allowed of one sign of impatience or wilfulness, to express his unwillingness to meet that fate for which he was prepared by a blameless life.

Dr EMLEN merited the praise due to wisdom; and it is of such that Cicero says,

Rectius enim appellabitur rex quam Tarquinius, qui nec se nec suos regere potuit: rectius magister populi (is enim est dictator) quam Sulla, qui trium pestiferorum vitiorum, luxuriae, avaritiae, crudelitatis, magister fuit: rectius dives quam Crassus, qui, nisi eguisset, numquam Euphratem nulla belli causa transire voluisset. Recte

ejus omnia dicentur qui scit uti solus omnibus. Recte etiam pulcer appellabitur: animi enim lineamenta sunt pulchriora quam corporis. Recte solus liber, nec dominationi cujusquam parens, neque obediens cupiditati. Recte invictus, cujus etiam si corpus constringatur, animo tamen vincula injici nulla possint.

ARTICLE XII.—*Biographical Notice of* HENRY M. READ, M.D. *By* D. THEODORE COXE, M.D.

The short career allotted to the late Dr READ will account for the comparatively brief obituary herewith presented. The laudable custom of the Kappa Lambda Society, however, of noticing the decease of its members, not being intended solely to commemorate age and eminence, is here complied with—and so long as this Society exists, may it never cease to offer an humble tribute of affectionate respect and remembrance to its junior and undistinguished members, as well as the eulogistic and laudatory oration upon its senior and eminent ones. The brotherly communion among its members, which Dr READ so highly prized, was indeed of short duration; for, just as an increased acquaintance was revealing to his professional brethren the merits which his diffidence and reserve had at first partially concealed—the arms of friendship were exchanged for those of death!

HENRY MEREDITH READ was born in Philadelphia, October 31st 1802, and there received the rudiments of his education. He early showed a fondness for books, and read with care and profit. His disposition was kind and affectionate, and characterized by a freedom from all jealousy and harshness. These qualities, joined to his equable temper and warm feelings, soon gained him the attachment of his young associates, notwithstanding his naturally retired character. An inclination to abstract himself from the world increased with his years, and eventually led to the solid improvement of his mind.

Early placed for his education in the University of Pennsylvania, he there pursued his studies for some time; but his friends, appreciating his capacity for literary attainments, and thinking a more re-

tired spot would suit him better, transferred him, at the age of fourteen, to a private school at Trenton, New Jersey, under the superintendence of the Rev. Mr Filer, whose object was to instruct a limited number of pupils, and thus do them more ample justice. The change was beneficial, and young READ made satisfactory progress. Among the most diligent, he rose early and continued late, that he might be prepared, and give satisfaction to his instructor.

The course of studies at this seminary was particularly calculated to prepare young men for Princeton College, and thither accordingly READ went at the end of two years, being, in May 1818, admitted into its junior class. Here he remained two years, diligent in his studies and exemplary in his deportment, and finally received his degree of Bachelor of Arts, together with one of the honours of his class. His unwearied application during his four years at Trenton and Princeton is thought by his friends to have first weakened his constitution, and laid the foundation of the disease which eventually terminated his career.

On his return to Philadelphia, his first object was to select a profession, and after wavering for some time, he at length fixed on that of medicine, being thereto much influenced by his grandmother Mrs Meredith, daughter of the late DR CADWALADER, and who had in many respects supplied the place of his mother, whom he had lost some time before. He accordingly commenced his studies under Dr CHAPMAN, and attended the lectures of the professors in the University of Pennsylvania.

In April 1822, he became a resident student of the Alms House of this city, and assiduously devoted himself to the duties of his station, which he discharged to the satisfaction of all concerned. At the end of a year he left it, with the regrets of his associates, and the grateful recollections of its inmates.

Having completed the usual preparatory routine, and satisfactorily acquitted himself in his examination before the medical professors, he received, in the spring of 1823, his degree of Doctor of Medicine, taking for the subject of his thesis "The treatment of Mania à Potu."

Shortly after commencing his professional career in this city, he was appointed one of the physicians to the guardians of the poor, and became a member of the Medical and Kappa Lambda Societies of Philadelphia.

In the fall of 1827, an advantageous situation for his professional pursuits offering itself, he removed to Mount Moriah, near the bound-

ary line between Pike and Northampton counties in this state. He here established himself perfectly to his satisfaction, and soon acquired the esteem and regard of all who became acquainted with him either privately or professionally. The future was now bright before him. But alas! "how many of our most certain and brilliant prospects fade before the blasts of earthly misfortune! hope rises before us like a meridian sun, throwing a halo of glittering splendour o'er our path—but ere the buds of promise open, they are withered and destroyed by the reckless hand of death!"

Thus it was with Dr READ. In the midst of his usefulness, and at the threshold of life, he was attacked by an affection of the liver, which baffled his own skill and that of his friend and physician Dr ROSA; and in a few weeks, at a distance from his family, he breathed his last: thus adding another solemn memento to the mournful catalogue of afflicting dispensations to which our transitory scene is subject.

Bibliographical Notices.

ARTICLE XIII.—*Traité Général d'Anatomie Comparée. Par* J.-F. MECKEL. *Traduit de l'Allemand et augmenté de Notes, par* MM. RIESTER, *et* ALPHONSE SANSON, *Docteur en Chirurgie de la Faculté de Paris. Précédé d'une Lettre de l'Auteur. Tome* 1*er. Paris*, 1828. *Pp.* 613.

A General Treatise on Comparative Anatomy. Translated from the German by MM. RIESTER *and* SANSON. *Vol. I.*

SUCH is the title of a work which will, we are convinced, form another monument of fame to the already highly distinguished author. Having previously given to the world the result of his researches in human, pathological, and systematic comparative anatomy, the learned professor of Halle brings before the public the present production, with every claim to the respect and gratitude of his fellow labourers in this field of science. His English and American readers must feel themselves under many obligations to his French translators, not only for their accurate version, but for the judicious observations contained in their valuable notes. We view the successful prosecution of this valuable department of science by our contemporaries of the continent of Europe, with mingled feelings of respect and mortification. As Americans, and members of a great and enlightened republic, our pride is naturally wounded by a conviction of the total apathy with which is regarded the teaching of comparative anatomy to our medical students. The science indeed is as totally neglected in our medical universities as if it constituted no branch of medical, not to say of *universal*, knowledge. Perhaps this neglect may be in some degree attributable to the aversion of some of the learned members of our profession to acknowledge the importance of a science, to the principles of which they have themselves devoted scarcely any attention; but let them reflect, for a moment, on the difficulties which they have encountered in the intricate paths of even elementary knowledge; let them but view the endless chain of exploded theories of respiration, digestion, secretion, the generation of animal heat, &c. which but for the reprehensible ignorance of their authors, of comparative anatomy and general physiology, would never have found existence. In fine, when we consider that all we do really know of the functions of the human body is directly or indirectly due to the study of compative anatomy, including general physiology, we will be forced to acknowledge,

with Haller, that medicine is more indebted to this than to any other branch of knowledge.

The labours of BLUMENBACH, MECKEL, RUDOLPHI, TIEDEMANN, RATHKE', TREVIRANUS, &c. in Germany, of CUVIER, BLAINVILLE, GEOFFROY, and many others, in France, and of LAWRENCE, M'CARTNEY and HOME, in England, among the modern authors who have successfully cultivated *comparative anatomy*, justify the assertion, that "a knowledge of the facts to be derived from its study is absolutely indispensable to the philosophical and successful prosecution of the study of human physiology, pathology, and the doctrines of hygieine." We cannot but cherish the hope that the day is not far distant, when America, who has so liberally repaid her European debt in some other departments of science, will also soon assert her claims in this.

The present work of M. MECKEL should be placed in the hands of every student of comparative anatomy, after he has made himself acquainted with Baron CUVIER's Leçons d'Anatomie Comparée, which may be considered as an epitome of the whole science. Our author's work abounds in enlightened general views, and contains numerous facts which, in their origin and promulgation, are peculiarly his own. Among the first, must be classed M. MECKEL's proposition to unite all the varieties, in the corollaries of a common law, which he terms "*the Law of Variety.*"

The author observes in a natural chain of reasoning;—"after having endeavoured to develop these laws and conditions in memoirs particularly devoted to the subject, I have thought it necessary to collect all the subordinate circumstances which the animal kingdom presents, when viewed in general, into two principal points, viz.: *variety*, and *unity* or *analogy*.

"It is, in fact, under these two points of view that we ought always to consider the animal form; if we expect that the exposition of this form should not consist merely in the enumeration of differences and individualities, or in following specious resemblances, which too frequently exist only in the minds of those who search for them."

We think we detect some allusion, by the author of these remarks, to the peculiar views and speculative philosophy, disclosed in the "*Philosophie Anatomique*" of M. GEOFFROY ST HILAIRE; many of whose ideas have been far from appearing to us as philosophical as they are novel. For example, we are taught that the cranium of animals, as generally considered, has no existence, but that the bones of which it is constructed are rudiments and modifications of the vertebræ. Again, he relates that the cloaca of oviparous animals is nothing more than the bladder of mammalia, with the rectum opening into its fundus; through which must pass not only the fæces, urine, &c. but also the eggs of the female; though the author neglects to inform us, how, in this case, we are to arrange those animals which possess both cloaca and urinary bladder distinct, many examples of which will be furnished him by his intimate knowledge of the anatomy of the amphibia, &c. We have also, occasionally, been under the necessity of differing with M. GEOFFROY in matters of fact, as well as of opinion. We have seen it published, as one of his discoveries, that he has been enabled to detect the existence of the umbilicus in the fœtal opossum. We have been unable to detect any rudiments of the organization alluded to, in the fœtal opossums which we have dissected.

Returning to the work of M. MECKEL, we detect no views merely spec-

ulative, much less any unphilosophical deductions. In treating of special anatomy, more particularly, he has offered many new observations and descriptions. We must not pass "sub silentio" his interesting discovery of the *mammæ* of the ornithorhynchus, or duck-billed quadruped, of New Holland; an animal hitherto supposed to be oviparous. The animated discussions to which this discovery has given rise in Europe render the subject highly important. If M. MECKEL's opinion should prove correct, it will destroy the intermediate class of "*Monotremata*," in which M. GEOFFROY has arranged the ornithorhynchus and echidna, and replace these in the situation which they formerly held, at the end of the class Mammalia; besides annulling our belief in a circumstance altogether astonishing, and hitherto without analogy; viz. the oviparous birth of animals mammiferous in all the grand points of their organization. But if we can no longer doubt the existence of mammæ in these paradoxical creatures, it yet remains to be proved that the organs really exist otherwise than as mere rudiments. Indeed, how is it possible for a young animal with the bill of a duck to live by sucking? To us it appears that it would require something more than "a great sensibility of the lips" to enable it to suck a mamma confessedly destitute of a nipple. The author states a fact, in his opinion, confirmatory of the nature of the glands in question; viz. that these organs have no existence in the male. This circumstance would incline us to infer directly the reverse; as in all animals truly mammiferous, these glands, particularly the nipples, equally exist in both sexes. We are strongly inclined to the opinion that, in the ornithorhynchus the mammæ exist, as these organs do in the male of all quadrupeds, viz. as rudiments, or marks of the "mechanical" laws on which the body is constructed. If we rightly remember, the eggs of the animal have recently been received in Europe.

The order MONOTREMATA must still continue to present us with that truly singular phenomenon, the existence of oviparous mammalia.

M. MECKEL, after having determined the various composite organs which occur in the construction of animals, classes the animal kingdom according to the complication of its organization; placing the polypus first in the scale, as offering the greatest simplicity of structure. The first volume contains four chapters: 1. On the laws of formation. 2. On the most important conditions of the animal form. 3. On the law of variety. 4. On the law of reduction to a common type. We anxiously wait the arrival of the future volumes. H.

ARTICLE XIV.—*A Practical Treatise on Poisons and Asphyxies, adapted to General Use, followed by directions for the Treatment of Burns, and for the Distinction of real from apparent Death. By* M. P. ORFILA, *Professor of Medical Chemistry, &c. &c. Translated from the French, with notes and additions, by* J. G. STEVENSON, M.D. *Boston*, 1826. *Pp.* 230, 12*mo.*

Our notice of this translation has been delayed by accidental causes. This we regret, as we conceive it well worthy of the widest and most rapid dissemination. That by Dr WILLIAM PRICE has not, we believe, been republished in

America. The reputation of M. Orfila, and in particular, the usefulness of his "Secours a donner aux personnes empoisonnées et asphyxiées," are too well established to require being made known through the present vehicle. The learned author is perhaps that individual, in a scientific nation, who has in the completest manner applied science to this subject. The giving of medico-legal testimony in France is not, as with us, referred to the nearest medical man, however little his previous studies and habits may have qualified him for the delicate task: there are, in the departments, *juries*, as they are called, appointed by the government, whose especial duty it is to furnish it whenever required by law. The preparation requisite for serving in such a commission necessarily requires a considerable amount of labour; and whatever objections we may have to the appropriation of a term, taken from the more republican practice of our Saxon ancestors, to a body selected by authority, there can be no doubt that individuals so chosen will be better informed upon the subject than practitioners at large. At the head of these institutions, the French government has placed the author of the present work, and never has an appointment been more fully seconded by public opinion, even including nations remote from the scene of his employments. The commanding rank of M. Orfila leaves him at once perhaps without a rival; and we are bound to admire the energy of character which leads him to persevere in his useful industry, still making new discoveries and improvements, long after the fear of competition is extinct, and the love of utility which induces him, at the height of science, to prepare the humble and popular manual before us. "Daily experience proves that diseases of this nature seldom terminate fatally, except in consequence of the ignorance of those who surround the sick at the commencement of the affection." P. 1. If this be correct, of what infinite importance is it then that books of this kind should be in the hands, not only of medical men, but of all those who, by character or station, possess that influence over the minds of others which enables or calls upon them to give directions in cases of alarm and emergency. Clergymen, magistrates, and private individuals distinguished for their force of character and general information, are frequently looked up to, in the absence of physicians, for their advice in cases of difficulty and terror. To such, therefore, in addition to the profession, is this volume addressed, in the original; and we certainly conceive the principle to be at least equally applicable in this country.

The style is popular and brief; the descriptions of symptoms, and the directions for procedure, as short as possible, divested of every unnecessary word, and generally of every unnecessary remedy. M. Orfila has, we think very properly, omitted all antidotes of doubtful or dangerous use, or which are difficult to obtain; and confined himself mainly to a few simple and safe articles, always easy of access. Of these, the principal are, the *white of egg, milk, common salt, vine gar, lemon-juice, soap, and gall-nuts.* The person, physician or otherwise, who refers to a practical volume for instructions in a sudden and alarming case, does not wish to find himself bewildered by long chains of investigations, or a superabundant choice of remedies, with regard to whose usefulness he cannot make up his mind. What he needs is prompt and explicit directions which may enable him to act with decision and dispatch; and, if he employ the volume before us, he will not be disappointed.

The author begins by general considerations on poisoning, its symptoms and treatment. He then proceeds to classify poisons; dividing them into 1, The

irritating; 2, The narcotic; 3, The Narcotico-acrid; and 4, The Septic or Putrid Poisons, a division which he composes of venomous bites or stings, animals injurious when eaten, and the matter of malignant pustule and hydrophobia. Under each of these classes, as much is said of their common characters as the case admits; thus saving the useless labour of repetition. The reader who wishes a complete account of the symptoms indicating any poison, must, therefore, peruse the paragraphs at the head of the chapter. This arrangement greatly contributes to the brevity of the book, of which the reading part is comprised in 230 duodecimo pages. Next follow the symptoms and treatment of asphyxies, the means of making the important discrimination between asphyxia and apoplexy in new born infants, and those of distinguishing real from apparent death, so necessary to guide us in our endeavours to recover the drowned, &c.; and the whole winds up with practical directions on the treatment of burns, a subject of great interest, and for want of a knowledge of which great sufferings are often incurred. In running over this, we feel called upon to express our satisfaction that the emollient and sedative plan is here recommended, instead of spirit of turpentine, alcohol, ammonia, heat, and the other mercies of the *homœopathical* treatment. We appeal, for the justification of our remark, to the memory of any one who has been so unfortunate as to experience a comparative trial of the two modes of treatment in his own person, and who has had, at the time, vitality enough to feel their effects. M. O., however, still retains lime-water, and admits the application of acetate of lead to denuded parts; so that those fond of witnessing contortions in the patient's countenance may still enjoy that satisfaction under the authority of this distinguished name.

In an appendix, brief directions are given respecting the precautions necessary in opening dead bodies with a medico-legal view, in drawing up reports, &c. which are much needed. They are extracted from a little code of instructions by professor CHAUSSIER.

We have not room for many more remarks, and will only add that the translation is well, neatly, and remarkably clearly executed, not excluding an occasional oversight; and that the copy in our hands is extremely neat in paper, typography, &c. From the fact of its being made in America, we derive an intrinsic recommendation to the book itself; as such a one, on equal terms, may always be presumed to be better adapted to our wants; and, besides, it is desirable to promote the existence, among ourselves, of a class of labourers, whose employment is to enrich our libraries with judicious selections from the treasures of European science.

ARTICLE XV.—*Versuch einer kritischen Geschichte der bei Vaccinirten beobachteten Menschenblattern, nebst Untersuchungen über die Natur, die Ursachen und die Verhütung dieser Krankheit. Von Dr* ADOLPH FRIEDRICH LUDERS, *Köneg. Dän. Physicus zu Eckernförde im Herzoth. Schleswig, Mitgliede der Königl. mediz. Gesellschaft in Kopenhagen.*

An Essay towards a critical history of the Small Pox, as it occurs subsequent to Vaccination; together with an Inquiry into its Nature, Causes, and Mode of Prevention. By Dr A. F. LUDERS, *Health Officer for Eckenförde in the Duchy of Silesia, Fellow of the Royal Med. Soc. of Copenhagen. Altona,* 1824. *Pp.* 226, 8*vo.*

A copy of this work was some time since presented by the author to the library of the Philadelphia Medical Society. Though we were much pleased with its contents when we first hastily perused it, and laid it upon our table for a more minute examination, we have not until now had time to take it up, with the view of presenting our readers with a sketch of the experience of Dr LUDERS on the important subjects of which it treats. At a period, however, when every thing in relation to small pox and vaccination is undergoing the investigation of the medical profession in this city, we conceive that we should not be fulfilling our duties as editors, were we longer to delay some account of Dr L.'s interesting publication.

It is very generally known, that soon after the promulgation of the discovery of vaccination by Dr JENNER, the practice was introduced into Germany, and every measure taken by the several local authorities to extend its protecting powers, in the most effectual manner, to every individual within their jurisdiction. So successful were these efforts, that for a period nearly of twenty years, the small pox was unknown in many extensive districts, and it was even believed that this destroyer of human life had been effectually expelled from that portion of the globe. In 1822, however, and subsequently, variola appeared as an epidemic in Germany, and the other northern countries of Europe, and to the surprise of all, affected many who were supposed to have been fully protected from its influence by vaccination.

During these visitations, Dr L. held the important situation of *Physickus*, or health officer, for Eckenförde, in the Dutchy of Silesia, the very duties of which office obliged him to see and study the disease to an extent, far beyond what is in the power, generally speaking, of any private practitioner. The experience thus obtained, has enabled the Doctor to bear ample testimony to the efficacy of vaccination as a means of disarming small pox of nearly all its terrors. So far from being weakened in his confidence as to its preservative powers, he conceives that he has reason to maintain, that an individual whose system has once been effectually placed under the influence of genuine vaccine virus, is forever exempted from an attack of small pox, even in a modified form. In support of this opinion, he refers to the fact, that of 233,939 persons vaccinated, in Holstein, between the years 1801 and 1822, but two, as late as 1824, had been affected subsequently with small pox in any form; and that in Denmark, among 447,605 vaccinated individuals, but one case of modified small pox had occur-

red*. Other countries, he adds, as France, Sweden, Prussia and Austria, "present an equally favourable result in proof of the entire protection afforded by the genuine vaccine disease."

The reason why small pox, subsequent to vaccination, has so frequently and extensively occurred in Great Britain and other countries, Dr L. attributes to one or more of the following causes. 1. The use of vaccine virus of an inferior quality, only calculated to produce a vesicle of a modified character. The inferiority of the virus may, he conceives, be owing to its having been procured from a vesicle on the teat of the cow, other than genuine vaccine; from the modified vesicle which forms in those who have been previously vaccinated, or have experienced small pox either natural or by inoculation; from the modified vesicle frequently occurring from even the genuine virus in the less susceptible constitution of adults; from the modified vesicle formed even in children of cachectic habits, or who are labouring at the time, under some cutaneous disease; from vesicles previously ruptured, or of too long standing; or from a serous vesicle. The lymph or virus employed may also have deteriorated from having been too long kept; from exposure to damp, acid or strong scented vapours, &c. or, finally, the inferiority of the virus may arise from its gradual deterioration, in consequence of its having been successively transmitted, in the reproduction of the disease, through too great a number of individuals. 2. In communicating the vaccine disease, the formation of too few vesicles. 3. In cases where there has been but one vesicle, its having been rubbed, or otherwise accidentally ruptured, or its having been intentionally opened to obtain lymph. 4. The vaccine vesicle having undergone a modification in consequence of the coexistence of some constitutional affection, as scrofula, venereal, &c., of cutaneous eruptions, or of a state of convalescence from any severe or debilitating disease. 5. The vesicle having been modified either by external remedies, as camphor, and the ointments of mercury or lead, employed during its progress, or by internal remedies, as mercury, nitre, long continued purging, &c.

Dr L. conceives, that the modifications produced by the foregoing causes very generally escape the notice of the careless observer, more particularly, as even in the various public institutions, too little care is taken to watch attentively the progress of the vesicle subsequent to vaccination, in order to be assured of its regular progress and genuine character.

Dr L. affirms that in Germany, the vesicles produced by the matter resulting from the successive reproduction of the disease, from the virus originally sent to that country from England, are marked by an areola of less extent, and a less degree of irritation of the general system, than those produced by matter from the cow, after only three or four reproductions in the human system; and that while modified vaccine vesicles were, at the time he wrote, of more common occurrence, large, unequivocally genuine vesicles were less frequently met with than when he commenced vaccinating.

Dr L. is no advocate for revaccination; he does not believe that the preventive or modifying powers of vaccination are in any degree weakened by time. He has been well assured that modified small pox has occurred at every period,

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* In 1809, there were admitted into the Hospital at Copenhagen, 139 small pox patients, of whom one was supposed to have been vaccinated, and three had previously had the small pox. Page 74.

from three weeks to twenty years, subsequent to reputed vaccination, without the character of the disease being marked by any greater or less degree of severity, in consequence of the greater or less interval which had elapsed since vaccination had been performed.

Dr L. examines the question of the identity of the modified form of small pox and chicken pox, and adduces many facts and arguments to prove that they are distinct diseases.

Dr LUDERS is undoubtedly a man of talents and observation. His entire work is deserving of an attentive perusal on the part of every practitioner acquainted with the language in which it is written. Besides the important collection of facts and observations it contains, the result of the author's own experience, in the two first chapters will be found a succinct account of the several varioloid epidemics which had occurred down to the period of its publication, with a copious reference to the various sources from which the materials for this account are derived, whether separate treatises, or essays contained in the medical journals of Europe and America. φ. κ.

ARTICLE XVI.—*An Essay on the Structure, Functions, and Diseases of the Nervous System; defended before the Medical Faculty of the University of Pennsylvania, March* 14, 1828, *for the Degree of Doctor of Medicine. By* JOHN R. W. DUNBAR, A.M. *of Virginia, &c. 8vo. Philadelphia. J. Dobson.*

It must be very evident that the anatomy, physiology and pathology of the nervous system, are subjects of far too extensive a nature, to allow of either of them being treated, with any degree of minuteness, within the narrow limits to which an inaugural dissertation is necessarily restricted. In the essay before us, the author has, therefore, attempted nothing more than a brief, but accurate outline of some of the more important points connected with each: in doing which, he has fulfilled, in a very happy manner, all that could be demanded of him in a thesis.

Though the production of a student, and laying claims to no higher character than that of a mere digest of the opinions and labours of others, we are nevertheless pleased that the essay has been committed to the press; not only from the beneficial influence this will be found to exert over the future pursuits of the author, but, also, from the persuasion that its pages may be read with profit, by many who are engaged in the active duties of the profession, and who, being excluded from extensive libraries, and remote from the centre of medical intelligence, must be indebted to summaries like the present for their knowledge of the improvements daily making in the various branches of our science.

Such as we have described it, but little of novelty can be expected in the present publication. The curious reader will, however, be pleased with the following extracts,—which may be adduced in confirmation of the opinion of the Royal Philosopher, that, "there is no new thing under the sun."

Speaking of the supposed modern demonstration of the origin of the nerves, Dr DUNBAR observes, "BARTHOLINUS, whom I shall quote more particularly hereafter, says expressly, 'the use of the lengthened and spinal marrow is to be the original of all the nerves; for from that part thereof within the scull, those nerves arise which are commonly attributed to the brain, being usually reckoned to be seven pair; but from the longest part thereof, which is [in] the back bone, anatomists do reckon thirty pair of nerves to arise, viz. as many as there are holes in the vertebræ.'" Again, the optic nerve, remarks Dr D. "is generally described by anatomists as originating from the thalamus nervi optici; but the late observations of GALL and SPURZHEIM, confirmed by TIEDEMANN and SERRES, show it to arise on each side from the tubercula quadrigemina." "The originality of this assertion has been supposed to be due to Drs GALL and SPURZHEIM; but the following passage from BARTHOLINE proves that the fact was not unknown to him. Speaking of the origin of these nerves, the latter says 'they arise not, as the common opinion is, from the forepart of the basis of the brain, for their original must be sought further towards the hinder part of the head, where they are carried between the brain and the beginning of the spinal marrow, and *arise out of the beginning of the first trunks* of the medulla oblongata, growing out of the brain. But RIOLANUS demonstrates that they are turned round about those eminences of the brain which GALEN calls thalamos nervorum opticorum, which reach into the foremore ventricles to fetch optic spirits from thence.' In a previous passage he styled the nates and testes the roots of the medulla oblongata."

"TIEDEMANN," remarks our author, "has clearly demonstrated that the spinal marrow is not an appendage to the brain, but that this latter is a production, or to use the language of REIL, an efflorescence from it; and he observes, that although this opinion was previously advocated by the ancients, yet to Dr GALL must be awarded the merit of having clearly proved it in modern times. But I am inclined to think that this gentleman has not such valid claims to originality in this respect. I find in BARTHOLINE the following language: 'We make the marrow, both as it is in the skull and in the back bone, to be the beginning rather of the brain; and that the brain being divided into two parts is, as it were, a certain double process or production of the marrow itself.' This he gives as a new opinion of his own: he then goes on with his proof; 'which is more manifest to those that behold the anatomy of fishes, for there the head and tail of the marrow is very great, but the process of the marrow or the brain is very little; the cause whereof is that fishes use motion more than sense; intimating that the brain or barke contributes more to sense, and the marrow itself to motion. Hence fish are dull of sense but very nimble in motion.' And again, a little farther on, he says, 'The lengthened marrow arises as some conceive from the brain alone, according to others from the brainlet or cerebellum. But it hath both (to speak now at a vulgar rate) for its beginning. For it arises from four roots or foundations, two of which are greater, from the fore part of the brain, commonly so called; two are lesser, from the inner part of the brainlet or petty brain. From these united the spinal marrow seems to be constituted. *But it is peradventure a more true opinion to think that these originals are processes of the marrow itself*, as was said before.'

"His language, also, with regard to the manners of dissecting the brain is, I think, entitled to a place here, as it is strictly applicable to the divided opinions

and practice of the anatomists of the present day. 'Some with GALEN, VESALIUS, and FALLOPIUS, intending to contemplate what is contained in the brain, begin their dissection in the upper part and proceed to the lower, and therefore do unfitly propound and explain many parts. I, treading in the steps of CONSTANTINUS VAROLIUS, shall take quite a contrary course, yet such as is *true* and *accurate*, beginning at the lower part of the brain and so passing to the uppermost; and I shall afterwards propound the order of parts from top to bottom, for their sakes that will needs follow the *vulgar and common way of dissection*.'"

Dr D. also points out a very remarkable coincidence between the opinions of BARTHOLINUS as to the formation of the lateral ventricles, and the views of the German and French anatomists*.

We have only room to notice the following fact, to which, although it was before not unknown to us, we feel pleased that the author has adverted. "Dr PHYSICK, in his inaugural thesis, *De Apoplexia*, printed at Edinburgh in 1792, intimates very clearly his doubt of apoplexy being a result of gradual compression of the brain; and he consequently thinks that distention of the blood vessels or extravasated serum can hardly be received as causes." This is precisely the opinion of SERRES, as maintained in his work on apoplexy, published a few years since. Φ. Χ.

ARTICLE XVII.—*Mémoires sur le Traitement des Anus Artificiels, des Plaies des Intestins, et des Plaies Penetrantes de Poitrine. Par* J.-F. REYBARD DE COISIAT, D.M. *Ancien Chirurgien des Hôpitaux de Lyons, &c. A Paris*, 1827. *Pp.* 205.

Memoirs on the Treatment of Artificial Anus, Wounds of the Intestines, and Penetrating Wounds of the Thorax. By J.-F. REYBARD DE COISIAT, M.D.

This memoir possesses interest, not only from its intrinsic value, but also on account of its relation to Dr PHYSICK's method of treating the same distressing injury. For the opportunity of presenting an account of it, we are indebted to the politeness of professor GIBSON, who liberally communicated the pamphlet to one of our number.

In an advertisement of fifteen pages, Dr REYBARD gives an historical sketch of what has been hitherto done and attempted for the cure of artificial anus. M. DE LA PEYRONIE appears to have been the first among modern surgeons who recommended the attempt to be made to effect a radical cure: this he proposed

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* See "BARTHOLINUS's Anatomy," published by N. Culpepper, Gent. and ABADIAH COLE, Doctor of Physic. London, 1668.

to bring about by diet and compression. M. Louis refuted his theory; and showed that the real security for a cure depended on the size of the existing intestinal tube. Desault applied pressure to the dividing edge, between the upper and lower ends of the interrupted intestine; while he endeavoured to restore the lower one to its natural size by dilating it with plugs of lint.

Le Cat and Bruns proposed to cut off the edges of the unnatural orifice, and close them by the first intention; and caustic has been tried in the same way. All these methods were followed by serious consequences; and the number of cures obtained was very small. Next in order follow the proposal of Smakalden, and the operations of Dr Physick and M. Dupuytren; which we have noticed in Vol. II. pp. 269, 273 of this Journal. Mr Collier, an English Surgeon, has, since then, succeeded in radically curing an artificial anus by the Taliacotian operation. The edges of the anus were pared to the quick, and a flap dissected from the adjacent portion of the skin of the abdomen, and secured by stitches; which very curious proceeding met with complete success. M. Jobert has noticed the extreme difficulty of engrafting one portion of intestine within the inferior portion; in consequence of the want of disposition in the mucous membrane to adhere. M. Denans has succeeded in procuring adhesions between divided portions of intestine, in two dogs, by the following process. Two flat rings, of silver or tin, were thrust into the two ends of the intestine, in such a manner as to invert a small portion inwards, leaving the extremities covered by a fold of the serous coat. These were then brought in contact, and pressed against each other, by a third ring, which was introduced into them both, and secured by a spring. The whole was then returned into the cavity of the abdomen; the wound healed over then; the serous coats adhered; the portions turned inwards sloughed and fell off, and the rings were discharged by stool. This appears never to have been repeated in the human subject. M. Colombe, on the other hand, despairing of the radical cure, has invented an ingenious tube, to be attached to the artificial anus externally; so as to allow the fæces to follow their natural route, without any surgical operation.

M. Reybard considers the instrument which he has himself invented as an improvement, both upon the enterotome of M. Dupuytren, and the simple ligature of Dr Physick. He employs a double forceps, of light construction, one of whose branches is to be introduced into each of the two folds of intestine; while a slider, with a cutting edge, is to be protruded between them, in such a manner as to divide the included portions of the bowel; thus producing an incision of the same kind with that made by Dr Physick. By this process he hopes to create the lateral opening between the two intestinal tubes, without occasioning those violent symptoms which followed the operation of M. Dupuytren, and from which that of Dr Physick is not wholly free. The substitution of cutting, for the severe process of artificial mortification produced by the former surgeon, must certainly save the patient from great sufferings and dangers, if, at the same time, he be equally free from the appalling risk of peritoneal inflammation. Whether the surfaces retained in contact by the instrument of M. R. will adhere with sufficient certainty to produce a vital closure of the cavity of the abdomen, and thus prevent such alarming consequences; or whether it will render the probability of the latter less, than in a case where severe inflammation and gangrene are produced in an intestine, are questions which can only be settled by experience.

The instrument of M. Reybard is composed of a *body*, two *branches*, and a cutting *blade*. The body is nearly similar to a spring-forceps such as is used for dissection, but cut off at the length of an inch and a half. From *each* of these terminations runs a *branch*, composed of *two* stalks of steel, united at their ends by a rounded termination, and leaving a space of about two lines between their parallel sides. When the instrument is closed, the spaces thus included in the two "branches" correspond with each other; so that the cutting blade can move through both at once. The branches are four inches long; and so slender and elastic that, with whatever force the forceps-shaped part is closed, it is impossible for them to bruise the intestines, but the latter will merely be kept in contact with each other. In using the instrument the points must come in contact first; and the fissures in the branches, destined to receive the cutting blade, must be a little wider at their commencement, with a large previous space for the introduction of the blade. The latter is affixed to the two sides or stalks of the upper branch by two projections like the heads of screws, divided lengthwise to receive the steel stalks; and the whole instrument must be fitted to perform its motions with neatness and certainty. The compression of the two branches or blades of the forceps is made by two screws, one on each side.

The cutting blade is a long lancet, or instrument like the blade of Dr Physick's gorget, provided with the two projections already mentioned, which must be capable of turning round. The external part of the edges of the cutting blade must be blunt, and a little thickened, to protect the adjacent parts; and the blade should be prevented, by the construction of the instrument, from approaching, within a considerable distance, the extremity of the branches. This is not only to prevent the edges of the blade from being blunted, but to obviate the danger which occurs when the instrument is slightly retracted by any accident; an event very liable to occur; in which case, effusion may take place into the cavity of the abdomen, and produce the most fatal consequences.

The first case in which M. Reybard applied his instrument was that of a woman of Dauphiny, aged 36 years, who had been affected for a month with a large wound or ulcer in the lower part of the belly and in the right groin, through which she discharged all her fæces. The origin of this injury is not given; but as the intestine emerged from beneath the crural arch, it is presumable that the case was one of femoral hernia. The ulcer was very large and deep, with abrupt, red, and inflamed edges, and the surrounding parts were also red to a considerable distance. In the bottom of the wound, the lower portion of intestine formed a small tumour, so prominent that M. R. found it necessary afterwards to extirpate a portion of it in order to bring it within the level of the skin, for cicatrization. The end of the upper portion, through which the fæces escaped, was so deeply immersed in the wound that it was necessary to distend the skin with considerable force in order to bring the orifice into view.

Into the orifices thus situated, however, M. R. was able to introduce, with facility, the female catheter; and, as this was the case, he judged it unnecessary to widen the wound, but immediately proceeded to insert the two blades or branches of his enterotome. Standing on the right side of his patient, he experienced no difficulty in doing this. Each branch was placed in its corresponding intestine; the screws were tightened, and the cutting blade attached to the superior branch of the instrument on which it was made to slide. Holding the forceps in the left hand, the operator then pushed the cutting blade along its guid-

ing branch; and thus effected the division of the two intermediate portions of intestine, without the least difficulty, and with so little disturbance to the patient that she continued "knitting" during the operation, of the serious nature of which her surgeon had not made her aware. When M. REYBARD, previously to making the section of the membranous partition, had *twisted* the instrument, with the view of gaining an additional certainty of its two parts being correctly placed, the strain thus inflicted on the bowel produced a painful sensation of *dragging* in the parts within, but the section appeared to be altogether without pain. No means are mentioned by M. R. as having been employed to ascertain that no other fold of intestine, than that designed, was included in the grasp of the enterotome. From his description, we presume that he depended, for this, upon the close proximity and parallelism of the branches, and their meeting with no resistance during their simultaneous introduction. For two days, the patient continued to lie on her back, but experienced no inconvenience except from a voluntary retention of urine; a restraint to which she had subjected herself from the want of instructions, and which had gone near persuading M. REYBARD of the existence of *peritonitis*—a very fair specimen of the anxieties of an operation in new circumstances, the patient being affected with restlessness, heightened colour, and abdominal swelling. On the second morning, the usual fæcal discharges were found on the dressings; but after this, nothing was there met with but a little yellowish liquid. In 47 hours, M. R. withdrew the forceps: he then found that his little finger passed with ease into the orifice, and entered the abdomen under Poupart's ligament, but he could not reach the undivided portion of the membranous partition. He judged that the incision passed an inch within the ligament: and had it not been sensibly within the latter there must have continued an escape of fæces. To this a stop was effectually put; and an immediate improvement was visible both in the condition of the wound, and in the patient's general health. The escape of fæces, however, returned when the patient was allowed, ten days afterwards, to leave her bed; and M. REYBARD did not succeed in completely closing the small stercorary fistula which remained, until he confined the patient's thigh in close approximation to her abdomen, by means of bandages; thus favouring the cicatrization of the wound by position. In 25 days, however, this took place, and the woman was discharged; requiring no other treatment than a hernial bandage and compress, such as are substituted for a truss.

His next case of artificial anus was in a boy 7 years old, who had received a penetrating wound of the belly. He was affected with a tumour of considerable size, formed of a portion of the great arch of the colon, inverted on itself; and situated on the left side of the scrobiculus cordis, under the edge formed by the cartilages of the ribs, and three fingers' breadths below the extremity of the xiphoid cartilage. The lower end of this tumour was divided into two portions; of which that on the right hand eventually appeared to be the extremity of the lower portion of the divided intestine, covered both within and without by its own mucous membrane, which had been forced, in redundant folds, out of the intestinal cavity. The left end appeared to be one of the cells of the colon, enlarged, and crowned, at its most pendulous extremity, with copious vegetations. The anal opening, belonging to and terminating the cavity of the upper portion of intestine, was on the right side of the tumour, near its origin; and this was surmounted by a singular excrescence, larger than a hen's egg, appearing to be

formed of protruded mucous membranes, and exhibiting two additional openings, which originally gave to the case the appearance of having two artificial anuses, but which eventually were found to have no connection with the intestinal cavity, though they communicated with one another. The formation of this singular structure M. Reybard endeavours to explain; but we frankly confess ourselves unable to understand his description. M. R. cut off the tumour containing the two additional orifices, leaving the pendulous tube, which it was his intention subsequently to use as a plug, to close the mouth of the wound. He also attempted to reduce the pendulous tube, but soon found this impossible from its hardness and adhesion. He next made an incision into it, of an inch and a half in length, opposite the anal orifice, but found considerable difficulty in completing this part of the operation, from the redundancy and laxity of the internal mucous membrane, which retired before his bistouri. After completing this incision, he examined the adjacent portions of the intestine still retained within the abdominal cavity, by means of his fingers and the female catheter. The intestines were found to meet each other at a right angle, instead of being placed, as in many other cases, parallel, like the two tubes of a double-barrelled gun. From this cause, considerably more force was required to bring them in contact and retain them, than that exerted by his enterotome in the preceding case. He consequently was gratified to recollect that he had provided a stronger one. This was introduced with some little delay, arising from the thickness and divergency of the included parts; but the instrument was finally screwed up, the cutting blade adjusted, and the section of the membranous partition completed, without any further difficulty.

The patient was then left in bed, placed on his back, with the forceps of the enterotome secured in its place by being attached to two turns of bandage fixed round his waist; and the wound was closed with lint, spread with simple cerate, and surmounted with compresses.

We omit part of the details of the treatment. The little patient was troublesome and ungovernable; and various articles were given him for food, which were considered highly improper. Nevertheless, with some retching and fever, he got through the first two days; and, at the end of forty-eight hours, the instrument was removed. The pendulous tumour was found in a state of lively inflammation, and did not return to its usual size for two weeks. Moderate pressure, however, by means of lint, compresses, and bandages, was found completely to control the progress of the fæces; and from this moment the child had one or two stools every day. As soon as the inflammation had entirely disappeared, M. R. raised the pendulous tumour, and gradually applied it to the wound; during which process, it greatly diminished in size, and completely filled up the orifice.

At the end of about a month, the child had a severe indigestion from excess in eating; which increased a diarrhœa under which he had been labouring, produced colic, fever, marked irritation throughout the whole course of the alimentary canal, sensibility of the abdomen to pressure, and the discharge of an immense number of lumbrici both by the natural anus and by the wound. The fever became very severe, *took the adynamic character* (typhus mitior), and the diarrhœa continued to increase. The little ungovernable sufferer would neither drink what was offered to him, nor submit to injections. Emollient applications, including embrocations with oil, were made to the belly; but, for medicine and ptisan, the surgeon

was reduced to the employment of simple water. Under this treatment the fever diminished: but the diarrhœa and prostration of strength continued, augmented by the indigestible articles of food which the attendants thought themselves obliged to permit the child to eat; such as potatoes, chestnuts, and the rind of bacon. Two months were consumed in this manner; and the emaciation became so great that M. REYBARD sent him to the country; despairing of success in any farther operation until his health should be established. When this should be the case, of which M. R.'s last information encouraged him to entertain hopes, it was his intention to endeavour to engraft upon the orifice a piece of the inverted intestine; removing for this purpose the edges of the opening, and one of the mucous membranes of the intestine. The irreducible portion was then to be amputated, and the cavity of the part employed as a graft, destroyed with caustic potassa. Should this fail, a slip of the adjacent skin was to be employed in the same manner, by the Taliacotian method; a process which has already proved useful in his hands, in an instance to which we shall shortly allude.

This curious case is also remarkable for its origin. The primary injury had been a wound of the abdomen, without any puncture of the intestine; but the surgeon, instead of simply reducing the bowel, and closing the wound, thought proper to *affix a ligature quite round the intestine*, thus producing, gratuitously, all the phenomena of strangulated hernia. We have asked ourselves the question, how far this might have produced the two unusual openings which appeared to traverse merely a portion of the mucous membrane. Could not such an effect have ensued from the operation of a ligature, lax enough to permit a mass of the mucous membranes to pass through it, but capable of making them slough after they had become tumefied? This "singular operation," occurring in so scientific a country as France, affords us, we must confess, some comfort for the bungling occasionally seen in our own.

M. REYBARD next inserts the account of Dr PHYSICK's operation, as translated from the fourth number of this Journal. "This," he states, "may be considered as the starting point of all the improvements which have been made in the treatment of unnatural or anormal anuses."

The case which is placed first in the memoir of M. REYBARD is truly a most interesting and curious one; but it does not furnish an instance of the application of his enterotome. Our abridgment of it must, therefore, be extremely brief. A soldier received several wounds with a cutlass, through one of which M. REYBARD found all the man's intestines protruded, and part of them lying beneath the pressure of his back and hips. Two wounds of intestines were found, which M. R. retained externally, while he reduced the remainder. One of these was nearly at the commencement of the ileum, and consisted in a slit of an inch and a half in length, situated obliquely, with its edges greatly reverting themselves. M. REYBARD cut a flat piece of fir wood, 15 or 16 lines by 8 or 9, through which he passed the ends of a long ligature, so as to appear on the same side, about 3 lines apart. These ligatures were then armed with needles, and passed through the edges of the intestinal wound; and afterwards combined in the eye of a single needle, and passed from within outwards, through the abdominal parietes. M. R. then carefully adjusted the lips of the wound in such a manner as to place their peritoneal surfaces in contact with the lining membrane of the abdomen, drew the ligature moderately tight, and tied it over a little roll of linen.

In 48 hours the ligature was cut off, and, shortly after, the piece of wood was rejected through the artificial anus formed by the other wound.

This last was a puncture of the colon, which had been torn open, until it embraced half the circumference of the intestine. The remainder of the case is most remarkable for the use of a silver tube, with the object of confining the fæces, for the time, to their natural course, allowing the external wound to contract, free from the irritating contact of the fæces, and keeping the inferior orifice from excessive contraction; for the employment of the Taliacotian method, under very unfavourable circumstances, with great advantage; and for the achievement of the final cure by the *position* described in the case we have placed first in this analysis. In this case, as may well be supposed, severe peritoneal inflammation took place, and was combated with the utmost difficulty.

To this curious and valuable document are appended a course of experiments on dogs, a short memoir on penetrating wounds of the thorax, and a case of exostosis of the cranium; of all which we can only regret that our limits prevent us from presenting an abstract.

It was found, in a dog, that a *tight* ligature upon the flat piece of wood was liable to occasion gangrene in the peritoneum; and that if the ligature was applied over a hard substance, the integuments were apt to inflame in a troublesome manner. The slip of wood came away, without inconvenience, per anum; and on dissection, six weeks after the operation, the adhesion round the wound was found converted into a membranous bag, communicating with the intestine. Of six trials of these experiments, four succeeded, one suffered an artificial anus, and one died in four days, after suffering much by colic and vomiting. More than twenty attempts to engraft one intestine within the other, as advised by writers, uniformly failed; while, by means of the previously described enterotome, the lateral union was accomplished with ease in four cases. Dissection showed the edges of the divided double membrane, united together and projecting into the intestinal cavity, and only effaced where the intestines adhered to the wound. This latter was not closed, until after the destruction of the lining mucous membrane, by a tent, composed of lint, wet with a solution of caustic.

ARTICLE XVIII.—*On the Influence of Medicine. An Oration delivered before the Philadelphia Medical Society, pursuant to appointment.* By JOHN BELL, M.D. *one of the Corresponding Secretaries of the Society, Lecturer on the Institutes of Medicine and Medical Jurisprudence in the Philadelphia Medical Institute. Feb.* 9, 1828. *Published by the Society. Philadelphia*, 1828. *Pp.* 36.

So much difficulty is experienced by those who are in search of topics yet unexhausted, upon which to found the annual orations of societies, that we think Dr BELL really happy in having been able to select one, which, if we have pre-

viously heard discussed, we have forgotten the circumstance. And, were it not so, there is so much usefulness in thus recalling to the minds of professional men the claims of their vocation to the possession of high moral dignity; it is so elevating and ennobling, that sentiments of this kind can hardly be too often repeated, or too strongly enforced by the facts derived from history.

The object of the oration before us, is to exhibit, by a series of undeniable truths, the vast influence in favour of the moral and intellectual welfare of society, which has been, at all periods, exerted by the profession of medicine. The art of healing was, in the heroic ages, the attribute of a demigod; in Egypt and the Orient, that of the ministers of religion. And when in later times, wise and learned Greece substituted reason and exactness for the idolatry of the imagination; when truth and argument began to replace the decayed fires of poetical enthusiasm, she ranked her first literary physicians among her philosophers. From that hour to the present, amid all the vicissitudes of weal or woe which have befallen the human race; whether learning degenerated within the pompous but servile walls of decayed Byzantium; slept in the convent, to be occasionally awakened by some solitary monk, illumined beyond his age, but forgotten in its impenetrable oblivion; or flourished, amid the barbaric magnificence of Moslem greatness, in Bagdad, or in the Alhambra; still, through all these changes, we universally find the medical character united to philosophy and the love of doing good. The profession is essentially *philosophical;* and this is not confined to the study of abstract truth, but extends to the ethical duties of daily life. In no other is more knowledge of men required, for the discharge of the most essential and imperative obligations; nor are the medical rules of hygieine any other than an exemplification of those principles recommended by the wise of every age for the due and reasonable enjoyment of happiness. Neither does the philosophy of our profession end here. It is also necessary for the physician to set the most rigid bounds to his own love of wealth and reputation; to love his profession in the abstract, as a means of doing good, and as a noble employment of the faculties with which Providence has endowed his species. The constant exercise of charities, unrewarded either by fame, future patronage, pecuniary recompense, or private gratitude, is, we boldly assert it, in no class in life carried to so great an extent as in our own: and, indeed, without this sense of usefulness, and of the very partial value of riches and fame, it would be impossible for the greater number of physicians to abide the situation in which they are placed.

Of these elevated views we have had numerous bright examples; many of which are collected by our author, from the histories and biographies on our book shelves. Yet it is by no means necessary to refer to printed records for illustrations of this truth. Every medical man can probably recall, within the reach of his own memory, instances of the persevering practice of all these virtues, in the person of some quiet, unpretending man of labour, whose life has been spent in ill-rewarded toils, without his ever aspiring or being admitted, to the pages of historic commemoration. The Christian's creed teaches that he will have another reward; and it is necessary that he should, for he does not obtain an adequate one from his fellow men.

Dr BELL's oration is learned as well as eloquent; and if we miss, in his enumeration, the names of SYDENHAM and BICHAT, it is probably because he considered their influence upon the public as too indirect, and as having been exercised mainly through the medium of their brothers of the profession. The former was

endeared to his fellow citizens by defying, on their behalf, the terrors of "the pestilence that wasteth at noon-day;" and the latter, by his genius, accuracy, and love of truth, was able to achieve the renovation of the French medical schools, and to elevate the character of his profession in the eyes of the public, by transferring to realities the exercise of those talents which had been so long wasted in authority and conjecture. But why should we seek for further instances, or endeavour to enlarge the list already furnished by our author of shining examples of what a physician may and ought to be? Enough has been done, within the limits of a brief address, to demonstrate the fact mainly in view; and more would not be sufficient to overpower the illiberality of those who would liken a profession like ours to any of the ordinary honest but selfish modes, by which men secure to themselves pecuniary wealth and importance in the community.

ARTICLE XIX.—*American Medical Biography; or Memoirs of Eminent Physicians who have flourished in America. To which is prefixed a succinct History of Medical Science in the United States, from the first settlement of the country.* By JAMES THACHER, M.D. *Fellow of the American Academy of Arts and Sciences; Honorary Member of the New York Historical Society, and of the New York Horticultural Society, &c.: Author of the American New Dispensatory, of the Modern Practice of Physic, and of the Military Journal. Two volumes in one.* 8vo. *Boston,* 1828.

The venerable author of the above mentioned work deserves the thanks of the public for this successful attempt to rescue from oblivion the names and histories of many excellent physicians who have honoured the medical profession in America.

We shall not attempt in this small space to describe his work further than by saying that it contains 159 biographical articles, some of which are written at great length, and with much elegance. Every physician who respects himself, is interested in the preservation of such materials as these; for every such man cannot fail to desire at least, that after the world and its temptations have tried him, he may not be found wanting in those qualities which entitle him to a place in such a collection.

Many a bosom has been warmed with emulation of those virtues described in the biographies of Plutarch; and it is a happy tendency of just and proper writings of this sort, to awaken and cherish the seeds of virtue, that might, without such culture, have lain dormant for years.

May the venerable author reap, for many a year, the harvest of reputation which here, and in other fields, he has planted.

ARTICLE XX.—*Constitution of the Medical Faculty of Caracas. Pamphlet. Caracas*, 1827. 4*to*.

We have received from our friend Dr SAMUEL BROWN, a copy of the constitution and laws of the Medical Faculty of Caracas, established in 1827, and for which he is indebted to Dr Vargas, of that city.

This body, which is authorised and even established by governmental enactments, has received the salutary power of examining and deciding on the claims of all persons who propose to practise physic in that country. It is also permitted to exercise a wholesome surveillance over the morals of practitioners, the conduct of apothecaries and druggists, and, in general, over all the interests which are concerned in elevating the character of the medical profession. These powers, if cautiously and wisely administered, will doubtless go far in redeeming medicine from the disgrace which ignorant pretenders are constantly bringing upon it in all parts of the globe. Thus science flourishes when protected by liberty, to whose temple she is led by the supporting hand of the *Liberator*.

We blush to say that in some of our comparatively old states no legislative provision, like that of Caracas, has been made for the security of those great professional interests, which sooner or later, by accidents or disease, are brought home to the business and bosoms of all civilized men.

Let us hope that a frequent and friendly intercourse of the physicians of both countries may give a new impulse to our noble profession. Let us hope that this excellent example from the south may be followed here in the north, and that in exchange for our political models, they may render back to us a more excellent pattern of zeal and devotion for the advancement of knowledge. In knowledge alone, rests the basis of real power and perpetuity for the institutions of both countries.

Quarterly Summary

OF

Medical and Surgical Intelligence.

I. ANATOMY.

1. M. J. ARTHAUD *on the Formation of the Cellular Tissue.*—The question M. ARTHAUD proposes to himself is, whether the cellular tissue is really composed of lamellæ and filaments, which, when united, constitute areolæ of a determinate form, or whether the areolæ are merely accidental, being produced by the dissector in handling it. MALPIGHI, RUYSCH, HALLER, BICHAT, BECLARD, and many others are of the former, while BORDEU, BLUMENBACH, MECKEL, AUTENRIETH, PROCHASKA, &c. &c. are of the latter opinion. MECKEL prefers to call it mucous tissue, and says it is coagulated; that when we move or pull it, it takes the form of filaments and lamellæ; that we can shew its cells by blowing air into it on the same principle that we can shew the cells in soap suds, or any mucus if we blow air into it.

2. *Stomach ending in a Cul de Sac.*—M. CROOKS in a German journal relates the case of a child which in external appearance was perfect. Six hours after birth it began to vomit a brown liquid. The vomiting soon became bloody, and when sixty-five hours old it died. The pylorus communicated with a sort of second stomach, or bag, which had no other opening except that of the pancreatic duct. It had no communication with any intestine.—*Journal des Progrès.*

3. BIANCINI *on the Communication between the Blood-Vessels of the Uterus and Placenta.*—M. BIANCINI injected the blood-vessels of a woman who died in child-bed with inertia of the womb, the placenta being still undetached from the uterus. He found the injection in the vessels of the chorion and amnios; and having examined the tortuous arteries of the uterus, he found that they penetratcd the tissue of the placenta, spread themselves over its membranes, and deposited the injection in the cells described by HUNTER and MECKEL. In a young woman who died eight days after delivery, a small portion of placenta retained its adherence to the womb. In this case, injection forced into the uterine arteries not only passed into the residuary portion of placenta, but also was extravasated into the cavity of the womb, and into the vagina, from the lacerated ends of what he calls utero-placental arteries.

But the most extraordinary facts in support of M. BIANCINI's opinions are those elicited from the examination of the subject in brutes. Not only did he find in cats that the colouring matter of fine injection passed to the umbilical vein, but he actually found the vermilion to have tinged the vena cava superior and some of its smallest ramifications. Such at least is the statement in the Jour-

nal des Progrès. We see not very readily why the vermilion should be found in the *upper cava*.

M. B. to make assurance doubly sure, next inverted the modus operandi. He injected mercury into the umbilical arteries of a calf, and found not only that it passed into the placenta, but directly into the uterine veins by nine short cylindrical branches, which he calls placento-uterine veins.

II. PHYSIOLOGY.

4. *Dr* MERRIMAN *on the Duration of Pregnancy.*—The question of the duration of pregnancy has never been satisfactorily settled, and as it is an important point in medical jurisprudence, the acquirement of some certain knowlege in regard to it, is extremely desirable. Dr MERRIMAN constructed the following table, which he laid before the Medico-Chir. Society of London, and which is published in Vol. XIII. Part II. of their Transactions. Whenever the Doctor has been requested to calculate the time at which the accession of labour might be expected, he has reckoned forty weeks from the last day on which any appearance of the catamenia was distinguishable, assuming that the 280th was to be considered as the legitimate day of parturition:

"*A Table of the Births of* 114 *mature Children, calculated from, but not including, the day on which the Catamenia were last distinguishable.*

	Births.
At 255 days	1
256 days	1
259 days	1
In 37th week	3
At 262 days	2
263 days	2
264 days	4
265 days	1
266 days	4
In 38th week	13
At 267 days	1
268 days	1
269 days	4
270 days	1
271 days	2
272 days	2
273 days	3
In 39th week	14
At 274 days	4
275 days	2
276 days	4
277 days	8
278 days	3
279 days	3
280 days	9
In 40th week	33

At 281 days	5
282 days	2
283 days	6
284 days	1
285 days	4
286 days	3
287 days	1
In 41st week	22
At 288 days	5
289 days	2
290 days	2
292 days	4
293 days	2
In 42d week	15
At 295 days	1
296 days	2
297 days	2
298 days	4
301 days	1
In 43d week	10
At 303 days	1
305 days	1
306 days	2
In 44th week	4 "

Dr M. thinks that we may infer from the above, that conception more frequently occurs soon after menstruation, than immediately before the recurrence of that discharge.

In a note is the case of a girl who swore to having had only one connexion, viz. on the 8th Jan. by which she conceived, and her child was born on the 18th October, which is 283 days.

5. *New Views of the Fœtal Circulation.*—We find in the Bulletin des Sciences Médicales for February, a notice of the work of Dr H. Fr. Kilian, published at Carlsruhe in 1826.

In the work is contained an account of the development of the heart of the fœtus, from its first appearance until the third and fourth months of gestation. M. K. asserts that in the early stages of pregnancy the inferior cava opens both into the right and left auricles by distinct mouths. At the commencement, the *left* opening is much the largest; but towards the close of the 9th month, the *right* has become much the largest. The valve of Eustachius and the valve of the *foramen ovale* constitute part of the inferior cava, and are to be considered as duplicatures or prolongations of the internal coat of the vein. These valves appear to be formed at the same epoch; but the valve of Eustachius is more rapidly and perfectly developed than the other. The valve of Eustachius, which principally constitutes the orifice of the inferior cava of the right auricle, serves to direct the two great columns of blood brought by the superior and inferior venæ cavæ, so that one may pass before the other without interference or mixture. The valve of the foramen ovale, or rather the left half of the lower cava is a *vascular branch*: its use is gradually to effect the exclusion of the *cava inferior* from the left auricle, and favour its passage or transfer to the right auricle. The septum of the heart is not perforated; the foramen ovale passes behind it

through a notch. There is, properly speaking, no pulmonary artery in the fœtus. The trunk that bears the name is continuous with the *canalis arteriosus*, and constitutes the origin of a vessel which goes to the lower half of the body, and may be named *abdominal aorta*, to distinguish it from the cerebral aorta which rises from the left ventricle; so that the fœtus has a double arterial circulation, one derived from the right ventricle, which goes to the body, and the other from the left, which supplies the head.

M. KILIAN's doctrine of the fœtal circulation is as follows. Blood comes from the cells of the placenta through the umbilical vein to the liver; it is there divided into two unequal portions, the largest of which circulates in the vessels of the liver, while the smaller portion goes through the *ductus venosus* into the vena cava. Here the blood of the ductus venosus, of the liver, and of the lower extremities is mixed. Just before it enters the heart, the current is divided, as above stated; one stream enters the right at the same moment that the other enters the left auricle. Upon the contraction of the auricles the ventricles are filled, and in their turn, they throw it out *without any mixture taking place;* for that of the right goes to the descending aorta exclusively, and that of the left is distributed upwards. The author asserts that if different coloured injections be thrown into the aorta and pulmonary arteries of a fœtus at the same moment, no mixture of colours will take place. The rest of the circulation, namely back into the veins, he explains in the ordinary manner.

6. *Anomalous Dentition.*—In the *Archives Generales* for Jan. we find the following, cited from the *Diario de las Ciencias Medicas* of Barcelona. Morelli, a tall well formed woman, had always enjoyed good health; she had suffered some attacks of toothach, which were easily relieved by the loss of blood. She was the mother of four children, and was again pregnant in March 1821, when she was afflicted with pain in the two molar teeth of the left side. The teeth were drawn, and she was relieved. In the following October the pain reappeared, and was followed by the eruption of two sound and perfect molar teeth in place of those she had lost. These teeth were always loose and troublesome, so that she had them extracted; but the pain after a considerable time returned, and two more teeth were cut in the place of them.

7. *Average Duration of Life.*—"M. ODIER has been lately engaged in investigations on the average duration of life in Geneva, all of which show a gradual extension of the period. The inquiries of M. ODIER go as far back as 1560, and may be fully relied on. From 1560 to 1600, the average duration of life was eighteen years and five months; from 1600 to 1700, it was twenty three years and four months; from this time, the period became gradually longer; and, from 1815 to 1826, the average was thirty eight years and ten months."—*Lancet.*

8. *Congenital Absence of Sensation and Voluntary Motion in a Female.*—This girl was born rather prematurely. She gave no sign of the usual instinctive desire for the breast; was, with difficulty, taught to suck, and appeared to be very feeble. One eye was smaller than the other. A few weeks after birth she was seized with convulsions: no medical prescriptions had any power to restrain them, and they exceeded a hundred in twenty-four hours. As she continued to grow in length, the defects in motion and sensation became more apparent. Blindness came on, she became quite deaf, and never had a second dentition. Taste seemed tolerably perfect. She never acquired any thing like the power of voluntary motion, and attained her 17th year without having held up her head, raised her hand to her mouth, or set her foot to the ground. She never uttered any thing like an articulate sound, and a feeble cry or whine was believed to indicate the want of food. When fed with sweet articles, the countenance exhibited an expression of satisfaction.

She never had a stool without medicine, and never acquired any command over the sphincters. On the day when she completed her 17th year, she died in a manner so gradual that the attendants thought her asleep, when she was really dead.

With regard to the morbid appearances on dissection, the following alone seem to possess any interest.

On removing the brain from the basis of the scull, so as to expose the nerves, he could trace each pair taking their usual course to their destination; and they all appeared firm and healthy, as in the most intelligent individual. But in the base of the scull itself not a vestige of the dura mater was to be seen. Its place was supplied by a thin semitransparent membrane, very lax and irregular, so that it afforded no protection to the nerves in their exit from the scull.

On the back part likewise, the whole or the greater part of the *tentorium* was deficient, thus allowing the whole weight of the brain to rest on the cerebellum.

The author's opinion is that the girl's deficiencies were occasioned by the want of dura mater on the base of the scull, the mass of brain being thereby allowed to press on the nerves of sense as they passed through their separate foramina, and thus their vital principle became destroyed; and that the cerebellum, not protected by a tentorium, was also pressed upon by the cerebrum, which also suffered in its turn.

III. PATHOLOGY.

9. *Dr Bayle on Insanity from Chronic Gastro-Enteritis.*—From the cases presented in our last, and from others of a similar kind, Dr BAYLE draws the following inferences:

1st. Chronic gastro-enteritis is capable, in a few instances, of occasioning mental alienation; and in very many cases, can prolong its continuance, modify it, and determine its character.

2d. Most of the insane who become so from a chronic gastritis, or gastro-enteritis, derive from their parents, or from their own constitutions, a strong tendency to delirium; their faculties are generally weak, and their brain prompt in taking on irritation. Frequently, also, the fears and anxiety which they suffer from the existence of the original disease, predispose them to insanity.

3d. The *anatomical* characters of chronic gastritis, or gastro-enteritis, when productive of mental derangement, do not by any means differ from those which are found where the same diseases exist without the subsequent occurrence of insanity.

4th. The organic changes going on in the intestines act upon the head in two ways. The first is by direct sympathy, precisely as the heart is affected at the same time, so as to produce fever. This occurs in the more violent cases, and produces mania, with a total derangement of the understanding. The other mode of operating on the head is by the pain and uneasiness undergone in the abdomen, which thus produce melancholy, hypochondriasis, and monomania. These agencies have been already enumerated as predisposing causes. See Proposition 2.

5th. The *symptoms* of sympathetic mania are referrible to mania and melancholia. Dementia may succeed to both these forms if they be of long continuance. The premonitory symptoms are the same in both instances; being indicative of disorder in the abdomen. Sometimes these are accompanied by a train of nervous phenomena extremely diversified in their character, and which, when combined with the fears of the patient, constitute a real hypochondriasis. Between the symptoms of actual mania thus produced, and those of the common kind, there exist no very essential distinctions. Yet, in the midst of the most furious excitement, we very frequently hear the most lively expressions of the fear of being poisoned; and often find the sufferer obstinately refusing all food—phenomena which Dr BAYLE considers as being produced by the abdominal pain, not as the subject of distinct conception and a rationale, but as giving a character to the delirium.

M. B. regards the *fear of poison* and the *refusal of food* as the most essential and invariable symptoms of mental alienation, when accompanied by chronic

phlegmasia of the digestive mucous membranes. They are owing, as has been already said, to the pain occasioned by the inflammation; and make their appearance alike, whatever be the condition of the intellectual faculties and the form of the delirium. We observe them both in melancholy, mania, and dementia; but principally in the first species, whether this be the product of the sympathetic irritation of the brain, or whether, arising from mental causes, it become afterwards complicated with gastro-intestinal irritation. These two symptoms are a real expression of the suffering of the stomach and intestines in the deranged; and, although they may exist without owing their origin to this cause, M. B. has never found them without concomitant signs of inflammation of the stomach. This remark is so well founded, that they sometimes exhibit themselves in a transitory manner in those insane who are temporarily attacked with acute gastritis. They are even seen in some whose brain is not deranged in its operations. M. B. has seen three patients labouring under chronic meningitis, with general and incomplete palsy, who were affected, during 7 or 8 days, with unusual redness of the tongue, and an increased frequency of pulse; and in these there likewise occurred a fear of poison and a refusal of aliments; both which peculiarities disappeared along with the gastritic symptoms already enumerated.

The local symptoms, which it would be very desirable to ascertain with correctness in this disease, are difficult to observe. The motions of the patient prevent the physician from ascertaining the condition of the tongue, the pulse, and the epigastrium. When the pulse has been felt, febrile excitement has often been discovered; a thing very naturally to be expected, but which is not invariably present. Diarrhœa is very common, and often fluctuates in a manner coinciding, in a remarkable degree, with the condition of the mental faculties.

The progress of the sympathetic mania may be either continued, remittent, or intermittent; but the first mentioned type is much more frequent than the others. When this is the case, the agitation and fury continue for a longer or shorter time, without offering any sensible diminution. Their duration is variable, like that of common insanity.

This malady may terminate in various ways. Sometimes the patients suddenly become calm and reasonable. The return of reason being accompanied by that of their ordinary powers of sensation, they complain of pains in the epigastrium or other parts of the abdomen, of headach, and of general uneasiness. Sometimes the tongue is red and the pulse frequent; and diarrhœa is a common symptom. In some instances, the gastric symptoms produce hypochondriasis, and furnish a serious impediment to the patient's ultimate recovery of the strength of his intellectual faculties.

In another set of cases, the agitation ceases suddenly, while the delirium persists, and the patient soon sinks; the physician seeing no other visible cause for his demise than the violent agitation to which he had been subjected. Commonly the tongue, previously to death, is found red and dry, and the pulse frequent; and diarrhœa often exists. Sometimes the maniacal fury gives way to a general collapse, in which are exhibited all the appearances of a *typhoid* gastro-enteritis. The lips are dry and brownish; the teeth and gums fuliginous; the tongue, red, dry, and brownish; there is a copious diarrhœa; the pulse is small and frequent; the decubitus a profound supination, and the faculties in a state of coma. Death soon terminates this catalogue of distresses. In other patients, there takes place a gradual marasmus, in consequence of the diarrhœa; which commences early, and slowly exhausts the sufferer: here his spark of life goes out with but little struggle, but without any of those consolatory intervals of reason and quiet, which sometimes meet the eye of the physician, but which are magnified in their frequency by the enthusiasm of the poet and novelist.

Finally, as already mentioned, a state of dementia may succeed to sympathetic mania; and may exist for various periods.

6th. The *treatment* recommended by our author for insanity complicated with gastro-enteritis, is to be directed in an especial manner against the abdominal phlegmasia. The remedies to be used are those which are adapted to the cure of the last mentioned malady, when not accompanied by cerebral symptoms; and are

to consist chiefly in the application of leeches to the epigastrium, in mucilaginous drinks, in a diet composed of aliments light and of very easy digestion, exercise, and sometimes derivatives. In addition to this, the mental derangement will require, according to the form which it assumes, the same means which are useful in cases of idiopathic mania: "such as seclusion, strong moral impressions, the shower-bath, reasoning with the patient, the strait-waistcoat, &c."

These observations of M. BAYLE may be considered as affording the means of distinguishing with greater precision those cases, in which the diseases of the mind are owing to irritation in the abdominal cavity—a curious subject of inquiry which has employed many minds. The opinions of the ancients respecting *atrabilis*, as a source of melancholy, and their treatment of insanity by purging with hellebore, must have been founded on observation; and, among the moderns, DUFOUR, PINEL, PROST, and ESQUIROL, have collected a mass of facts and arguments well calculated to enforce the idea.

10. *Small Pox analyzed physiologically.*—We continue, in this and one or two of the following articles, our series of cases extracted with a view to illustrate the history of gastro-enteritis. M. LERE'VE'REND, of Havannah, communicates two cases of the above-mentioned disease to the *Annales* of professor BROUSSAIS. We meet, prefixed to them, the 142d proposition or aphorism of the latter pathologist, which we translate.

"The small pox commences by an acute gastro-enteritis, which is the first effect of the contagious cause. The phlegmasia of the skin replaces it and terminates it when the pustules are few in number; but, if the pustules are numerous, they regenerate it, by the erysipelas which results from the confluence of the areolæ. This forms the secondary fever of the small pox, which is also called the fever of suppuration."

According to Dr L., the small pox reigned as an epidemic at the time of his arrival at Havannah; and the bad treatment there opposed to it rendered its mortality frightful. His first patient was a negro, who was seized, in the morning, while working at the wharf, with retchings to vomit, and with pains in the limbs and in the forehead, just above the orbits of the eyes. Dr L. was called in the evening, and found him with a supine decubitus, coma, his tongue red at the edges and point, and coated with mucus in the middle, the epigastrium very sensible to pressure, the urine small in quantity and red, and the pulse strong and frequent.—Twenty leeches to the epigastrium, with directions to suffer them to bleed all night; lemonade with gum arabic; entire abstinence from food.

2d day. Tongue less red; pulse still strong; patient delirious during part of the night; head burning; eyes injected; headach very acute; urine still scanty and red.—Thirty leeches in the course of the jugular veins; head bathed with vinegar and water; mustard baths to the feet; emollient fomentations to the belly; lemonade with gum; entire abstinence.—At his visit in the evening, Dr L. found "every thing restored to order." Some pustules had appeared upon the face and trunk; and the stomach and brain had returned to their physiological or healthy condition. The abstinence was continued.

On the 3d day, the eruption was general. The rest of the treatment was "employed to facilitate the progress and termination of the cutaneous phlegmasia; which ran through its periods without impediment."

Case 2. A coloured man, of a nervous and sanguine temperament, aged 20 years, was treated by the author, for a month, for gonorrhœa. He had taken balsam of copaiva, in pills, for three days; when on the morning of the fourth, he was seized with the desire to vomit, flexion of his limbs, and pain in the head. While in this condition, by the advice of a friend, he took a glass of gin. This was followed, almost immediately upon its ingestion into the stomach, by a severe pain in that viscus, and a constriction of the pharynx. The other symptoms were aggravated, fever declared itself, and he was soon seized with convulsions so strong that four persons could hardly retain him in bed. At six in the evening, Dr L. found him with his face presenting an animated expression, his eyes haggard, making efforts to escape from his bed, the whole surface of his

tongue extremely red, the epigastrium painful and of a burning heat, the pulse full and frequent.—Twenty leeches to the epigastrium, and an equal number on the track of the jugulars; directions to let the bites bleed all night; emollient fomentations to the belly; vinegar and water to the head; lemonade with gum; entire abstinence.

2d day. Tongue less red; expression of countenance improved; the furious delirium has subsided, but the patient now betrays occasional impatient motions. —Evening. All the cerebral symptoms have returned; an attack of epilepsy, with which the patient had been once previously affected at ten years of age; the skin dry. Bleeding of ten ounces from the foot; ice to the head; mustard baths to the feet; lemonade with gum; entire abstinence.

3d day; morning. Some eruptions on the face and thighs.—Continuation of the same means, except the bleeding.—The stomach and head were in good condition [supposed to be in the evening]. Vinegar and water were substituted for the ice.

4th day. A general eruption over the whole body.

6th day. The whole body "was a single wound." Emollients were opposed to the violent irritation of the skin; diet and demulcent drinks prevented the ill effects of the secondary fever; and the patient, at the end of thirty days, was in full convalescence.

After describing the above cases, Dr LERE'VE'REND remarks that he attended twenty-seven patients during the epidemic; that they were all treated according to the principles of the physiological medicine, and that he lost *none* of them. While his fellow physicians of the city, whom he describes as Brunonians, proclaimed that they had never met with so destructive a visitation of small pox; "he proved to them, by facts, that this was only the case in consequence of their bad treatment." His first success having attracted the public attention to him, various means were resorted to for the purpose of turning him into ridicule: among others, a caricature was made, in which he was represented, sitting upon a mass of ice, and bitten from head to foot by leeches. This was not productive of the effect designed: well informed persons inquired into the facts, and employed him, first for their slaves, and then for themselves. He informs us that, by those means, he was not long in becoming physician to the first houses in the city, among whom he includes his excellency, the bishop of Havannah; who employed him for an obstinate diarrhœa, "*after having perused the medical propositions of professor Broussais.*"

11. *Delirium from Intoxication, viewed physiologically.*—Dr FRANCIS BROUSSAIS, surgeon in a French regiment, reports the following case: Jordy, a chasseur, took, early in the morning of Jan. 1st, a draught of four sous' worth of brandy, with a piece of bread. He breakfasted, as usual, about ten o'clock; at noon he went to sleep, and was awakened at one, to prepare to mount guard. At 4, P. M. this man, together with two of his comrades, drank three bottles of wine at dinner, without experiencing any inconvenience.

About 6 o'clock, he was affected with a general chill, horripilation, and tremors of all his limbs, and gave way to loud lamentations and tears. Next followed a high heat, with great irritation, and vertigo. He was then taken with convulsions; and when held by his companions, struggled with violence, not recognizing any of them. His delirium was of a marked character: he struggled to escape from the hands of his comrades, exclaiming that he saw Satan, with a legion of devils. Soon after, he had a more agreeable vision, in the shape of a girl to whom he had been attached; and with this kinder or more deceitful spirit, he held conversation for some time.

Dr BROUSSAIS saw him at 10 o'clock at night. The pulse was found full and frequent, but not hard. The face was injected, the head and abdomen hot. "Forgetting all the riches of the pharmaceutical arsenal," says Dr B., "I had recourse to the simplest of remedies, intending to open a vein, should that prove insufficient." Provided with a pitcher filled with "protoxide of hydrogen," Anglicé water, this erudite medicament was freely applied, both within and without; the patient being urged to drink, which he did to the amount of a pint in two

hours, while cloths wet with the "protoxide" were applied to his head, and copious affusions made over his whole body.

After half an hour of this treatment, his delirium took the character of hilarity. He followed with his eyes the figures of his diabolical visitants, who were good enough to treat him to a grotesque dance. Occasionally, he manifested slight convulsive movements, followed by a species of exhaustion.

At one in the morning, he recognized his sergeant major, and, from that moment, recovered the use of his reason; he slept quietly, and awoke next morning with no other complaint than a slight sense of fatigue.

Our object, in extracting this and the foregoing cases, is not criticism, but the presentation of a lively idea of the practical application of the physiological rules of judgment. Where, however, strong temptation exists, we will not hold ourselves bound to refrain. This case is entitled "Delirium; hallucinations from gastric irritation. Recovery by the sole use of cold water." Dr Broussais considers the whole disease as produced directly by the stimuli applied to the nervous papillæ of the stomach. This he conceives he soothed by the application of the water; and adds that "the case comes in proof of this truth, which men, either superficial or not entitled to esteem, endeavour to dissemble, viz. that the physiological doctrine teaches to economize the blood and strength."

We do not think that any American hospital, army, or navy physician would hesitate a moment to pronounce the above case to be one of the disease which has been styled delirium tremens, or mania a potu; and to express strong suspicions which might tend to the detriment of the character which the patient might bear for temperance: for we suppose the said surgeon could hardly be made to believe that Jordy had not taken more liquor than he acknowledged, on the previous and perhaps preceding days. The phenomena much more resemble, to our view, the effect of a *suspension* than of a *continuance* of the use of spirituous liquors. Under this view, we do think it fortunate that he refrained from the very natural resource of blood-letting. With regard to the effect of cold water, we do not see how the theory explains the employment and usefulness of the cold affusions. At the same time, the advantageous effect of these latter is confirmed by various practitioners.

12. *Hydrophobia generated by Heat.*—According to M. Unanue, at the period of writing his topography of Lima, hydrophobia was unknown in every part of South America. It appeared for the first time on the northern coast of Peru, in the summer of 1804, during a prolonged heat which sometimes raised the thermometer as high as ninety-nine and a half degrees of Fahrenheit. Almost every species of quadruped was affected with the disease, but particularly the dogs. It did not appear in the capital till 1807. In the village of Jea, forty-two persons died after having been bitten by mad dogs. On the north coast, hydrophobia occurred in several individuals without any bite. On a sugar plantation, several slaves are said to have fallen victims to it, after having eaten the flesh of an animal which had died of it. The epidemic disappeared in 1808. Several dogs were affected with it *twice;* but then their bites produced no dangerous consequences.—*Journal des Progrès;* from the Zeitschrift von Henke.

13. *Imaginary Hydrophobia.*—A curious case is narrated in the same journal, from the Giornale de Fisica, &c. in which a man was bitten by his own dog, whom he supposed to be mad. The dog then disappeared, and the master was seized with all the symptoms of hydrophobia; being unable to swallow any thing for four days. On the 5th, the dog returned home, and as soon as he fawned upon his master in his usual manner, the dreaded malady disappeared.

14. *Tetanus.*—M. Lepelletier, surgeon in chief to the hospital at Mans, has always found, when dissecting cases of traumatic tetanus, that there were very visible traces of phlegmasia in the meninges of the medulla spinalis, especially of the arachnoid at the roots of the nerves, and over the latter during their progress through the spinal canal. After a case of well characterized tetanus with

trismus, opisthotonos, &c. the sacral nerves, especially the sciatic, exhibited spots and numerous striæ of a vermilion red. When divided longitudinally, the nerves presented the same striæ; and when cut transversely, exhibited a multitude of bright red specks, which were the orifices of vessels. All these appearances existed in the neurilema, either in the portion covering the nerve, or in that which separated its different fibrillæ; but principally in the former. If one of these divided nerves was pressed, it gave issue to a considerable quantity of blood. The medulla spinalis, when simply laid bare, exhibited bluish striæ, and its tunics seemed distended by a fluid. The fibro-cellular membrane, (?) when incised throughout its whole length, contained, on the inside, numerous red patches, especially at the origin of the nerves: and the arachnoid was particularly remarkable for a vascular network very strongly marked.

The arachnoid of the brain was considerably injected, but presented neither patches nor adhesions.

In another case of tetanus, the disease was provoked by the left arm having been crushed; and the first tetanic symptoms were manifested in the arm. The neurilemas, principally of the ulnar and median nerves, were red, and inflamed quite up into the axillary plexus. The spinal pia mater and arachnoid showed many strongly marked inflammatory spots; but all these appearances were confined to the side which had received the injury. The strongest characteristic marks of inflammation were found in those parts of the medulla spinalis which were most in connection with the brachial nerves, the first point of departure of the neurilematic inflammation. It is exactly in those muscles whose nerves arise from the portion of the spinal marrow already pointed out, that the propagation of the disease was observed. Thus the respiratory muscles exhibited the tetanic stiffness in all its force; and the patient was several times on the point of suffocation from the mechanical suspension of respiration; while the trismus was only consecutive, and the jaws could be separated to the very moment of death.

The resemblance of these views to those of Dr Sanders, of Edinburgh, will be noticed.

M. Lepelletier concludes, from these and other cases, that tetanus is an inflammation of the neurilema of the nerves and spinal marrow; (would he not include the trigeminus of the head in the case of trismus?) that traumatic tetanus spreads from the circumference to the centre, thus attacking the nervous tree from the branches to the trunk; that tetanic patients die from exhaustion, with the exception of those instances in which respiration is actually suspended long enough to produce a true asphyxia; and, finally, that the rational treatment for this formidable malady must consist in lowering the vitality of the injured organ in particular, and of the whole economy in general.

15. *Apoplexy of the Spinal Marrow.*—It is well known that the distinguishing mark of real apoplexy, viz. that which consists in an actual hemorrhagy in the brain, is considered by most of the modern pathological anatomists to be *palsy* of some part of the body. We have here a case of a similar affection in the medulla spinalis, reported by M. Hutin, in the Nouv. Bib. Med. Fev. 1828.

A man of about 70 years of age died suddenly at the Bicetre, and the following particulars were collected respecting his previous condition. He was of a strong and robust constitution, a middle stature, and a sanguine temperament; his body was slightly curved forwards, and his legs were weak and stiff; so that he habitually employed a staff for the mere purpose of preventing himself from falling forwards. He could walk from his residence at the hospital to the city; but this required a considerable time; and frequently, notwithstanding the support of his cane, he found himself drawn forward in such a manner as to fall, unless he arrested himself against a tree or some similar obstacle. His superior extremities had also lost much of their strength and agility. To an understanding naturally confined, were added, in this man, an extraordinary difficulty and slowness in pronunciation, which existed to such an extent as to deprive him of social intercourse, and induce him to live alone. He never complained, and had an excellent appetite. The day preceding his death he spent in walking about the hospital;

he retired to rest at six o'clock, as was customary with him; and at four in the morning was found dead in his bed. It appears, from statements made to Dr H. that this man had suffered several attacks of apoplexy, and that this weakness of his limbs was the consequence of them.

Dissection, twenty-eight hours after death. Flesh firm; fore-arm and fingers bent and strongly contracted; legs extended and stiff. On the incision of the teguments of the cranium, a large quantity of black blood escaped; another portion of a similar fluid ran out of the cavity of the cranium when opened Dura mater thin and transparent; sinuses engorged with blood; pia mater injected; brain possessing considerable firmness, except at the posterior and external part of the left hemisphere, where there was a slight superficial softening.

In each of the corpora striata there was a cavity, large enough to contain an almond, lined by a cellulo-vascular coating, infiltrated with a citron-coloured serum. The upper parietes of these spaces appeared to be formed by the arachnoid lining of the ventricle, thickened. The cerebellum presented nothing remarkable; but the pons Varolii was slightly softened. At the opening of the *spinal canal*, there escaped a large quantity of black blood; the meningeal veins were distended with that fluid; the arachnoid cavity contained much serosity, in which were floating a few drops of a fatty liquid, and some bubbles of air. In the arachnoid of the lumbar region, were a number of cartilaginous plates, of a bluish white, some of which exhibited, in their centre, a small bony point, projecting into the cavity, opaque, and composed of radiating fibres. The veins of the medulla spinalis were distended, and, particularly at the lower part, were very much dilated and flexuous; the imperfect partition which penetrates into the anterior and posterior fissures was strongly injected. The medullary substance possessed its natural consistency; it was grooved, in every direction, by numerous little vessels.

Between the origin of the fifth and sixth pair of cervical nerves, was found a small bloody effusion of the size of a pea, which had, in this place, destroyed the cineritious commissure. And at the elevation of the fourth dorsal pair, existed another much more considerable effusion, which had destroyed the continuity of nearly all the nervous matter of the medulla, whether white or cineritious. The clot of blood was as large as a good sized hazel nut, and a little elongated in the direction of the length of the canal. Adjacent to these two effusions, the cerebral matter was slightly softened, and infiltrated with blood.

The lungs were gorged with blood, and the cavities of the heart distended by large clots. The intestinal canal was sound.

16. *Atrophy, Hypertrophy, and Induration of the Spinal Marrow.*—Dr Hutin has published numerous cases and reflections respecting these diseases, from which are drawn the following inferences:

Atrophy may take place in the spinal marrow from various causes: sometimes it is from the entire absence of muscular motion, as in persons affected with hemiplegia or rickets, and the debility of old age; sometimes again, it seems to arise from some cause inherent in that organ, and which it has as yet proved impossible to discover. Very frequently, it is the result of a gradual and long continued pressure exerted on the organ.

It is, in general, not difficult to establish the diagnosis of atrophy of the spinal marrow. After having made out the existence of a more or less complete paralysis, which has developed itself in a gradual manner, without any other complication than coldness and wasting of the extremities, it will commonly be found that the previous history of the case will furnish sufficient means of recognizing and distinguishing the disease. It may easily be imagined that this must be a malady of unfavourable prognosis. If it affect only the inferior portion of the spinal cord, it suffers life to be prolonged under circumstances almost insupportable; depriving the patient of the use of his lower limbs. If, on the other hand, it occur in the cervical portion or at the cranial extremity, it sooner or later becomes mortal, after producing palsy in the arms, the organs of sense, &c.

Medicine is absolutely without resources against the spinal atrophy; nothing being able either to prevent it, arrest its progress, or effect a cure, with the single

exception of that which occurs as a consequence of the entire repose of the body. In this case, it seems that exercise of the limbs will, under some circumstances, impede its full development. Physicians who attend a large number of patients will undoubtedly have remarked, that those paralytics who submit themselves to their unfortunate destiny without a struggle, and suffer themselves to become a prey to apathy or chagrin, never obtain any relief; while those who exhibit energy, moral and physical, and oppose, in a manner, their will to the disease, often finish by recovering the use of their limbs, if not entirely, at least in a great measure.

We are not as yet possessed of a sufficient number of well recorded facts relative to the *hardening* and *hypertrophy* of the spinal marrow, to enable us to trace a complete and exact history of these two affections: from the observations of our author, however, it is admissible to draw the following conclusions. 1. Induration and excessive growth of the spinal marrow are of much more common occurrence than is generally supposed. 2. Their causes are still very obscure. 3. Their nature does not seem to be in all cases the same: and it seems, in fact, that, in some circumstances, they are really the result of excessive nutrition; while, in others, they evidently depend on a chronic phlegmasia. 4. The induration and hypertrophy most generally exist together; yet they sometimes occur separately. 5. When these two states were found simultaneous, the patient had previously exhibited a more or less considerable increase of the sense of touch in those parts which correspond to the diseased portion of the medulla; besides convulsions, spasmodic contractions, chorea, epilepsy, &c. &c. and a peculiar paralysis, characterised by the complete abolition of the force and energy of the muscles, coinciding, nevertheless, with *an entire freedom of motion*. 6. Hypertrophy, when not complicated, seems only to produce a greater or less increase of the sensibility of the nerves of touch; while all the phenomena just enumerated which occur in the muscular apparatus, have uniformly been found to co-exist with hardening. In the latter case there also existed a remarkable diminution of sensibility. 7. These two organic alterations are not necessarily mortal: all the patients having died under the influence of other causes. 8. Hardening and hypertrophy of the spinal marrow have always proved to be beyond the curative resources of medicine.—*Ibid.*

IV. THERAPEUTICS, MATERIA MEDICA, AND THE PRACTICE OF MEDICINE.

17. *Dysentery.*—Dr MEYER relates, in HUFELAND's Journal for April 1827, his success in the treatment of epidemic dysentery by the use of the nitrate of soda. His mode of administering it is as follows:

R. Nitrate of Soda, . . .	℥ss. to ℥i.
Common water, ...	℥viii.
Gum-dragon, . . .	10 grains.

Make a solution—of which the dose is a table spoonful.

This salt, which has a laxative and diuretic effect, cured, or at least mitigated very much the intensity of the disease in the space of twenty-four or forty-eight hours.

Though the dysentery in question was presented under an inflammatory type, it was rarely deemed necessary to have recourse to blood-letting, either general or local.

As dysentery has already appeared within the circle of our own observation and practice, and will no doubt, be engaging the attention of many of our readers at the time when these lines meet their eye, we deem it not improper or irrelevant to proffer a few remarks on the treatment of this ever formidable malady. Without any great pretensions to age or experience, we may be allowed to say, that for twelve years past, we have had frequent opportunities of witnessing and treating dysentery, under many varieties of climate and locality. Were we to be in-

fluenced by results alone, we might dwell with some complacency on the success of our practice; but as this, like experiment, is occasionally fallacious, we shall merely state the course which we have more usually pursued. Allowed from the very beginning of our career to act as free agents, we began with the use of the lancet, as well on the competent authority of classical medical writers, as on what seemed to be called for by the symptoms of the disease; and we can safely aver, that in no instance have we had reason to regret that free venesection had been practised, whilst we have, from time to time, had to reproach ourselves with procrastinating it in favour of pharmaceutical means. Of these latter we have used emetics, purgatives and opiates in the successive stages of the disease. We have at times, and indeed not unfrequently, placed great reliance on calomel, at first alone, and subsequently combined with opium, to alternate with or be followed by castor oil, or the oleaginous mixture. If we have not seen such notable differences to result from the operation of such various agencies, for to say various modes of practice would hardly be correct, we think the cause must be found in our having associated the lancet with all of them. We the more incline to this opinion, from having of later years obtained all that we could have once promised ourselves, by a restriction to venesection, general and local, and the use of diluent and demulcent drinks, with occasionally an opiate, by which we mean an opium pill or a Dover's powder. Of free cupping or leeching the abdomen, we can speak in terms of unequivocal praise, as an adjuvant to the lancet, finishing what the latter had begun, and removing the pain, tormina and tenesmus expeditiously and permanently. The effect of one operation, though often insufficient, will be of such a nature as to encourage to a repetition until every wish be realized.

The chronic form of dysentery, consisting chiefly of protracted and habitual morbid secretion from the mucous surface, which in the earlier period exhibited the more distinctly marked symptoms of phlogosis and tendency to ulceration, demands in its treatment certain modifications of that pursued in the acute stage. We say modifications: we do not mean essential differences. If the experience of impartial men has shown that astringents and tonics separately or combined, or joined with stimuli, are injurious, if not decidedly pernicious, in the first stage of dysentery, we are yearly acquiring conviction by similar evidence that these means are of little or no avail in the second or chronic. What large bleedings had accomplished in the former, small or local bleedings will ensure for us in the latter. If mercury and opium have benefited the one, they will not be without a salutary effect on the other. Here, however, we must be a little more explicit. It will have been inferred, and correctly by our readers, that we are disposed to abandon to the reprobation of the physiological school, the majority of the drugs in vogue for acute dysentery, and rest our hopes on general and local blood-letting, diluents, and an occasional opiate. But we are not yet prepared from the evidence, chiefly indeed on one side, which has been furnished to us in our practice, to make a similar surrender in chronic dysentery. We grant that we have done so in some cases with entire success and to our satisfaction; but we are required in a spirit of impartiality to say that other means have had as signally a beneficial effect. The chief of those we now proceed to mention.

Having studied, very early in our medical noviciate, the work of Mr ABERNETHY, in which the blue pill is so highly lauded in all the disorders of the digestive canal, we were naturally prepared to give it a trial in chronic dysentery. Circumstances having placed us for a time in a tropical climate, our attention was of course more specifically directed to the subject. What CLARKE had pointed out, in his work on long voyages, regarding the good effects of mercury rubbed down with gum arabic in dysentery, was made to us more convincing by conversations with a very intelligent and experienced resident surgeon, Mr PEARSON, of Canton, who expressed his decided preference for the blue pill, in those diseases in which mercury was called for. Opportunities were not wanting to test the correctness of this opinion, and we can now, after ten years experience, declare our firm reliance on the salutary operation of this formula, and of its su-

periority in chronic dysentery, over the other preparations of the metal. Cases of a protracted and obstinate character, have yielded to the blue mass in doses of five grains, once, twice, or thrice daily, with no other addition, either medicinal or dietetic, than rice or barley water, especially the former. If the occasion, or subject required additional enforcement of what we have stated by collateral proofs deduced from the operation of mercury, especially the blue mass, on the mucous membranes generally, or the recommendation of the medicine by approved writers on dysentery, such as BALLINGALL and others, we could readily present it with some force. But our purpose was to give what we conceived to be a satisfactory outline of the treatment of dysentery, and having accomplished this, we close our remarks for the present.

18. *Mercury absorbed into the System.*—The analysis lately made in the chemical laboratory of the Faculty of Paris, of the mammary and salivary glands, mesentery and large intestines of a young woman who had fallen a victim to puerperal peritonitis, and who during the disease had been subjected to large mercurial frictions (12 oz. 5 dr. in the course of twelve days), exhibited mercury in its metallic state in these organs. This result, though opposed to the assertions of many chemists and a great number of physicians, confirms the researches of FOURCROY, DUMERIL, ORFILA, and CRUVEILHIER, who have discovered mercurial globules in the bones, cerebral substance, and nerves; and no longer allows us to doubt of the fact, notwithstanding the warmth with which it has been at different epochs contested, and the ridicule attempted to be thrown on it.—*Journal des Progrès, &c. Vol. VIII.*

19. *Chronic Bronchitis cured by the External Application of the Acetate of Morphia.*—The Journal des Progrès copies from the *Methode Endermique*, of LEMBERT, an account of a cure of chronic bronchitis, in which the usual anodynes and pectorals, with a blister to the arm, were found of no avail. To relieve a constipation of eight days duration, five grains of powdered aloes were sprinkled over the vesicated surface, which after the lapse of ten hours gave rise to several alvine discharges and colicky pains. The effect thus produced encouraged Dr LEMBERT to make trial of a sedative remedy on the same surface. Accordingly on the 14th of March 1824, half a grain of acetate of morphia, in powder, was applied: this was soon followed by slight pricking felt in the sore; in a quarter of an hour afterwards the tracheal tickling was moderated and the cough and oppression diminished. On the 17th, an hour after the application of a grain of the acetate of morphia, the patient experienced a feeling of general ease and comfort, and enjoyed the luxury of sleep which had been so long denied her. The medicine was continued until the 22d, with an increase of the dose to two grains; and so decided was the amelioration of the disease that the cough had disappeared. Wishing to be assured that the subsidence of the catarrhal symptoms was entirely dependent on the acetate, its use was discontinued on the 23d. All the former evils promptly returned, with the addition of cold sweats, chills, and faintings. The use of the medicine was resumed on the 24th, in doses of three grains, and with so happy an effect, that, by the 5th of April, the patient was beginning to recover her flesh, and no longer was troubled with either cough or expectoration. Whenever the suspension of the remedy was attempted, the effect was invariably the same. That the imagination of the patient had no share in the cure was evidenced by frequently deceiving her either in regard to discontinuing the medicine or to using it, without the results being at all at variance with those before obtained. The dose was finally raised to four grains, and from this time forward, the condition of the patient became daily more satisfactory, evinced in a return to her former plumpness, with some degree of freshness of complexion; but still the acetate was continued. Towards the end of May, she felt so well and believed herself to be so completely cured, that she asked for leave to go home.

20. *Endermic Medication.*—For some interesting particulars respecting en-

dermic medication, of which the preceding history is an interesting example, and the best means of using it, our readers are referred to Vol. III. pp. 189—91 of this Journal. The following additional information is from the *Journal des Progrès*, which in its turn derives it from the work of Dr LEMBERT entitled, *Essai sur la Methode Endermique*. This method consists in applying active medicines to the surfaces of the cutis denuded by vesication, or to that of the subcutaneous tissues. From the means capable of producing vesication we must exclude boiling water as uncertain and dangerous. The pain so generally caused by vesicating substances may be greatly mitigated by surrounding them with emollient cataplasms. It is better to discharge the serum through an opening made in the phlyctena or raised epidermis, into which also the pharmaceutic agent is to be introduced. The absorption is thereby more active. During the dressings we must be careful to remove the suppurative coat formed on the surface, for which the chloride of lime answers very well. When it can be accomplished the medicines should be reduced to an impalpable powder; and if their immediate action be too irritating, they should be mixed with gelatin or lard, directing of course, in such cases, a corresponding quantity of the compound. Liquids ought to be slowly applied, drop by drop, and resinous bodies spread in the form of a plaster. The dose of medicines thus administered should be gradually increased, then be continued at their maximum for a while, and finally decreased. Their effect is more energetic in proportion as they are applied near the nervous centres; and more benefit will be obtained by their application to a number of small surfaces than to a large one which should equal all the others in extent. The accidents, that is the unpleasant and unforeseen or alarming symptoms following this kind of medication, may be promptly arrested by carefully cleansing the vesicated surface, or by compression or dry cupping, or finally, by the application of a substance possessing properties of an entirely opposite nature from that of the offending one. Thus tetanus brought on by two grains of strychnia has yielded to two grains of the acetate of morphia. Medicines applied to the cutis give rise to two well marked effects. The first, generally irritating, consists for the most part, in an itching or burning sensation, accompanied by redness and injection of the denuded surface. The second, as various as are the medicines applied, is evidenced at the expiration of about ten minutes, or one, two, or three hours after the application: it is usually displayed in a feeling of heat spread from the denuded part towards the nearest viscus, whence it is diffused throughout the animal economy, in following the course of the principal vascular and nervous trunks. The absorption seems to be more active at the internal than the external side of a limb, and at the anterior than posterior surface of the trunk; more in persons of a thin delicate skin than in those who have it of a dark colour, dry, dense, scaly, or hairy. It takes place with most effect in the evening, or at night after a bath, and when the digestive passages are empty. In fine, it seems to be more energetic in damp than in dry weather, and in hot than in cold seasons.

21. *Intermittent Fever.*—Among the many varieties of this disease we every now and then meet with some of a more peculiarly anomalous character; such as where only a particular part of the body is affected, and in which alone the three stages cold, heat and sweating are gone through. The *Journal des Progrès*, &c. Vol. VIII. furnishes us with several of these cases. In one, the disease affected only half of the body in a vertical direction, so that the median line was the boundary between the healthy and diseased parts. In another, recorded by M. DUVAL, the subject of which was a soldier in the military hospital at Brussels, the cold stage of the fever, which was of a quartan type, was accompanied by a violent spasmodic contraction of the lateral half of the body, most remarkable about the eyes and face, and communicating a hideous expression to the patient. But what rendered this case still more singular, the two halves of the body were, each in its turn, thus attacked alternately. We read in the *Revue Medicale* for 1814, of a man, who, from having slept in a room freshly plastered, was seized with intermittent fever in that side of the body corresponding to the

wall near which his bed was placed. M. D'Auxiron relates, in the *Journ. de Med. Tome* XXIV. p. 60, a case of intermittent fever, in which the lower half of the body, or its subdiaphragmatic was alone affected. As a parallel to these is the history of a patient given by Morgagni, in which jaundice supervened on hemiplegia of the right side, after an attack of apoplexy. The jaundice only affected, however, the paralysed side, and this in so distinct and well defined a manner as to contrast most singularly with the left, which even to the nose preserved its natural colour. Cases are on record of persons, who, all their life time, only perspired from one side.

Passing from the curiosities of the subject to what most of our readers will consider as of paramount importance, viz. the means of cure; we now lay before them the following note from Dr C. D. Meigs, on a formula, the administration of which in the practice of the writer, and many of his medical brethren, has been productive of the very best effects in preventing a return of the paroxysms of intermittent fever.

"In the autumn of 1823, says Dr M., I had a patient, Mrs J. C. who laboured under a severe tertian. I had vainly endeavoured for many days to cure her by means of various preparations of bark. When she recovered she informed me with much hesitation, that I had not cured her, but her disease had yielded to a medicine given by her kind neighbour Mrs C. As I had been much embarrassed by the obstinacy of the case, I called on the latter to make some inquiries, and was informed she had taken the liberty of interfering, because she had *never* been disappointed, in a great number of cases, where she had procured the medicine, either for the suffering poor, or for her friends, whose attacks had proved exceedingly obstinate *under* common modes of treatment.

"The formula was as follows:

Red bark in powder, ℥ss.
Theriac of Andromachus, ℥i.
Lemon juice, ℥ii.
Port wine, ℥iv.—M.

Of this mixture, one wine glass full was given at a dose every second hour during the apyrexia. Mrs C. assured me that she knew of more than one hundred persons who had taken it with success. From these representations, made by one on whose candour and good sense I could rely, I was induced to employ the formula in a great many cases; and the comparative results of my practice with this and various other formulæ for exhibiting bark, and its salts, have constantly impressed me with the conviction of its superiority over them all, as a general resort. Having communicated my success to several medical friends, I am confirmed in my opinion by their confidence in it, which seems to be not inferior to my own. I may take the liberty of mentioning that some of our professors have employed it very largely and successfully: indeed it has become here, merely on account of its excellence, a very common prescription.

"In recommending this mode of using bark, I hope to be exonerated from any imputation of encouraging an empirical practice; for I conceive that no such charge can be made against the employment of bark in intermittent fever. The physician must decide the proper time for giving the medicine. I will only further say, in relation to it, that I employ it in the first complete intermission.

"If any of the readers of this Journal should deem it proper, after what I have said, to prescribe bark in the manner above recommended, I have little doubt of their obtaining a success correspondent to that which in a great number of instances I have met with."

22. *Tetanus cured by the External Application of the Acetate of Morphia.*—We are furnished with two cases, one of traumatic, the other of idiopathic tetanus, in the essay on the endermic method by Dr Lembert, already referred to. In the first, that of a female, there was trismus, rigidity of the muscles of the neck; abdomen tense, hard as stone; legs convulsively flexed, and without the possibility of extending them, the eyes fixed, cheeks drawn back; the pulse was hard and frequent. Bleeding of twelve ounces, thirty leeches to the anus followed in

two hours by a warm bath of an hour's duration, and the use of mercurial frictions on the neck and legs, with a blister and sudorific drinks, were not productive of any marked effect. The endermic plan of Dr LEMBERT was then had recourse to, and a quarter of a grain of acetate of morphia, mixed with a minute portion of cerate, was applied to the vesicated surface, at ten o'clock in the morning of the the second day of the disease. The trismus ceased completely, but the rigidity of the neck still persisting, the dose of the acetate of morphia was doubled at eight o'clock in the evening. At eleven the functions were restored to their normal state, and the night was passed in a tranquil manner. The tetanus was in this instance consequent on an ulcer over the external ankle, in a woman aged twenty-eight years, of a scrofulous habit, in the hospital of Salpètriere.

The second case of idiopathic tetanus occurred in a female in the Salpètriere, with incurable herpetic eruptions on the inner side of the upper and lower limbs. The tetanic attack was immediately consecutive to fright and syncope caused by a companion with whom she was walking, falling into her arms in an epileptic fit. At eleven o'clock in the morning following her attack, marked by general rigidity and irregular contraction of the muscular system, a small blister was applied to the back of the neck, and removed at three o'clock in the afternoon. The vesicated surface was then sprinkled with a quarter of a grain of the acetate of morphia. At six o'clock, the trismus had disappeared, but the other symptoms still persisted. Another quarter of a grain of the medicine was applied, and at ten o'clock the fore arms could be extended. It was only during the course of the night that the muscles of the neck, face and eyes regained their customary mobility. By seven o'clock the following morning, the disease had entirely disappeared.

23. *Borax employed to cure Furfuraceous Herpes.*—In HUFELAND's Journal for October 1827, we are told, that a Dr REINHARDT of Mühlhausen (Prussia) had had a furfuraceous herpes on the dorsal surface of both hands, the skin of which presented scattered red spots. He determined on trying the supersaturated borate of soda, according to the method of HUFELAND, in the dose of half a drachm to an ounce of distilled water. During the first few days in which he made use of the solution, each successive application of it was followed by a stinging sensation and redness of the affected parts, so as to require a suspension of the remedy until the irritation thus produced had been removed. He then resumed it without any farther inconvenience. The herpetic eruption gradually diminished and at last entirely disappeared before the half drachm of the borate had been all used.

Some time after this two persons affected with furfuraceous herpes were treated by Dr REINHARDT in the same manner as that just detailed, and with the like success.

24. *Herpes of the Organs of Generation cured by the Hydrocyanic Acid.*—The Journal already quoted in the preceding article contains, in its number for March 1827, the account of a woman aged fifty years, affected with herpes about the genital organs, productive of excessively painful pruritus. Dr SCHNEIDER prescribed lotions of an alcoholic solution of hydrocyanic acid, in the proportion of a drachm and a half or two drachms of medicinal prussic acid to six ounces of alcohol. The patient was completely cured by this means in a period of fifteen days.

The same solution in six ounces of distilled rose water was attended by the like results in another female, aged eighty-four years. Dr SCHNEIDER reports three other cases in which he was equally successful with the remedy.

25. *Balsam Copaiba without Taste or Odour.*—The *Annales de la Medécine Physiologique*, for September 1827, give an account of the success of M. SALLE, who is both a doctor of medicine and an apothecary, in depriving the balsam copaiba of its unpleasant taste and smell, by which it so often nauseates patients for whom it is prescribed. We are told that the strength and medicinal properties of the article are not at all impaired by the process.

26. *Volatile Oil of Copaiba.*—We have lately seen, says the editor of the London Medical and Physical Journal (March 1828), some volatile oil obtained by distillation from copaiba, by Mr BATTLEY of Fore Street. It agrees in its physical and chemical properties with the oil of turpentine, excepting in its smell, which is somewhat different. There can be but little doubt that on this oil the powers of copaiba as a remedial agent depend; and if this be the case, the resin of copaiba, concerning which so much has been lately said, can have little or no activity, in consequence of the oil having been driven off. Several trials with the resin have proved the correctness of this inference. The volatile oil of copaiba requires a heat of about 600° F. to obtain it, and is then procured only in very small quantity.

27. *Iodine successfully used in the Treatment of Enlargement of the Liver and Spleen.*—Dr MILLIGAN at the Royal Universal Infirmary for Children, has succeeded in curing cases of enlarged liver and spleen, by the administration of the tincture of iodine (proportions not stated), after mercury had been employed in vain. Seeing the communication of Dr MILLIGAN under the head of "original papers" in the London Medical and Physical Journal, we were on the point of passing the article to its credit, when in some editorial remarks we find it mentioned, parenthetically, that the history of the cases is from the Medical Repository. By original papers most journalists understand essays or reports never before published.

28. *Nævus Maternus cured by Vaccination.*—We copy the following from the May number of the London Medical and Physical Journal.—Jane M'Gibbon, at three months, had, on admission into the Royal Infirmary, Glasgow, a roundish tumour, nearly as large as a sixpence, on the right side of the chin. It was considerably elevated above the surrounding skin, had a purplish colour, and appeared to be formed of blood vessels. At birth the tumour was only the size of a split pea.

Around the border of the tumour, as well as all over its surface, minute punctures were made, and vaccine lymph freely applied. In ten days thereafter, the whole disease was involved in one pustule; but when this became incrusted and was thrown off, there still remained a dark coloured, prominent, and diseased surface. Another suppuration succeeded, and a third; when, at the end of five weeks, a complete cure was effected, no trace of the disease remaining, nor mark, further than what follows vaccination on a healthy part.

This cure was hardly completed, when another little child was presented in private practice, with a nævus advancing rapidly and occupying the middle and edge of the upper eye-lid. The same process was followed with very similar results. A cure was effected, but after a very tedious festering and ulceration. Indeed it appeared evident that nothing further is required to effect a cure than to institute a process of suppuration, by cow pox, by caustic, or the like. As the most gentle of all these means, vaccination is entitled to a preference. But, when this has been used in the common way, and for the ordinary purpose, and before a mark of this kind has excited much attention, the writer is inclined to think that an antimonial plaster would constitute by far the best substitute. He regrets that no case has yet occurred to give him an opportunity of making the experiment.

Before these two cases fell under his care, a child was admitted into the Infirmary with a nævus about the size of a large almond, occupying the red part of the under lip. It was clipped away, not by triangular excision, but along the line of the lip. Three vessels required ligature, but in ten days the part was covered by a healthy cuticle, and no disfiguration occasioned. He is satisfied that this mode should more frequently be employed in extirpating cancerous lips. He has frequently performed it successfully in extensively diseased cases. It is uniformly practised by Baron DUPUYTREN.—*Dr* YOUNG, *in Glasgow Journal.*

29. *Muriate of Iron in Gastro-Malacie or Softening of the Stomach.*—The London Med. Repository and Review for May last furnishes the following article.

In an epidemic disease which prevailed at Heilbrun in 1825, Dr POMMER lost two children. Post mortem examination proved the affection under which they fell to be gastro-malacie. Some time afterwards he was called to attend two other children with the same disease, and from what he had learned of the practice of AUTENREITH with respect to the use of the muriate of iron in those violent diarrhœas which so frequently attend the severer forms of typhus fever, he was induced to employ it in these cases.

Case 1. This was an infant six months old. It was brought up by hand, and its health had been very good from its birth. It had been ill eight days. No food would remain on its stomach. It had six, eight or nine evacuations daily. Sometimes they were thin and aqueous, sometimes coagulated and pultaceous; they were pale coloured and extremely offensive. It was fretful, uneasy and seldom quiet; the face was very pale; it frequently thrust out its tongue. It had a haggard countenance. The state of the abdomen appeared natural to the sight and touch; not contracted by spasm nor distended, not too hard, too soft, nor too sensible. It had great thirst, a dry hot skin; the feet were sometimes cold, respiration was easy; the pulse was accelerated but not too hard, the sleep was short, disturbed, half comatose, with frequent startings, the eyes rolled; much groaning and restlessness.

The treatment was commenced by forbidding all aliment, except two spoonfuls of warm milk twice a day. A cataplasm made of red erichma bark, wild chestnut, willow bark, and aromatic powder, of each an ounce, was applied to the epigastrium. Cold applications were ordered for the head, and sinapisms for the legs. Two tea-spoonfuls of the following mixture were given every hour:

Take of Strong decoction of mallows-root, ℥ij.
Gum acaciæ in powder, ℥ij.
Muriate of iron, gr. x.
Syrup of mallows, ℥viss.—Mix.

The next day twelve and a half grains of the muriate were given in the same vehicle: during these two days the child vomited but once, and passed three green stools. In the morning of the third day it had two hours sleep, which it had not enjoyed for eleven days. It appeared much improved, but this amendment was not of long continuance, for the disease returned in the afternoon. On the fifth day the vomiting ceased, and only two alvine dejections took place. It now showed inclination for food, yet nothing was allowed beyond its milk. Its sleep was still restless, with occasional groaning and rolling of the eyes. The temperature of the skin became natural. The regimen and external treatment were continued; but as all the symptoms were gradually receding, the applications of cold to the head were less frequent, the muriate was now given every two hours, and on the eighth day of the treatment, the sixteenth of the disease, the astringent aromatic cataplasm was discontinued. The appetite not being satisfied by milk alone, light farinaceous food was given three times a day. At length convalescence became more and more established, and the child was restored to perfect health.

Case 2. Another child, four weeks old, presented the symptoms of incipient gastro-malacie. It was cured by the internal use of the muriate of iron, without the aid of the external applications which were employed in the above case. —*Heidelberger Klinische Annale*, 2 *B.* 2 *H.*

30. *Tetanus cured by Enemata of Tobacco.*—The patient was a shoemaker who had wounded the index finger of the right hand with his awl; but so slight was the puncture that he paid very little attention to it. Eight days afterwards Dr N. was sent for, and found on his arrival, that the man had all the symptoms of tetanus. He began the treatment of the case by scarifying the wounded finger and covering it with red precipitate and an emollient cataplasm: laudanum was given internally, and friction with mercurial ointment practised on the nucha

and jaw. He left word also that if all these measures failed of relieving, an infusion of two drachms of tobacco in a pint of boiling water should be given as a clyster. It was given accordingly at eight o'clock in the evening; the patient felt some uneasiness in half an hour after; but the stiffness of the muscles soon began to diminish, and with a little assistance he could carry his head forward; the contraction of the arms and thighs ceased, though the jaws still remained in close contact. The unfavourable symptoms having returned in a short time, a fresh enema was given, with the same effects as at first, but of shorter duration. The remedy was repeated however, until a cure was accomplished. The simultaneous use of bark, wine and laudanum was thought by Dr N. to have produced no apparent diminution of the malady, the symptoms of which yielded as soon as the patient had taken the enemata of tobacco, which always occasioned some distress, and occasionally vomiting, but rarely fæcal discharges. He thinks that the tobacco ought to be employed with great circumspection in weak subjects; whereas in those of a vigorous and robust make, with a full, strong and tense pulse, when blood-letting would seem to be indicated, it is a very valuable remedy.—*Journal des Progrès, &c. from a German journal.*

31. *Poisoning by a Tobacco Enema.*—To enforce with more effect the salutary caution given at the conclusion of the preceding article we subjoin the following. Elizabeth Payne, at Bethnal Green, near London, was persuaded, by an empiric named Gabriel Ore, to make use of a clyster made by infusing an *ounce* of tobacco in water, as a cure for worms. Soon after its administration, she was seized with horrible convulsions, and in fifteen minutes expired. On the testimony of a physician, Dr UGAR, that a sixteenth part of the above quantity of tobacco would be sufficient to cause alarming effects and even death, the quack who recommended this *specific* was committed to Newgate, after a verdict of manslaughter had been found against him.

32. *Dry Cupping and Ligature.*—M. MERAT, in a note to the Academy of Medicine of Paris, respecting the bites of serpents, stated, that it would appear, by a quotation from pere LABAT, as if for the last hundred and thirty-four years, the remedy of cupping, and the ligature, had been successfully employed against the bite of the trigonocephale snake.

33. The Revue Medicale, for February, contains a note from Dr J. B. BOUSQUET, giving the results of cupping, after vaccination had been practised. It would seem that although, in many instances, the application of the cups prevented the vaccine virus from taking effect, yet in others it had no such agency. Out of 200 punctures on nineteen subjects, there were 119 regular vaccine pustules; of which forty-three, or about a third, were raised and developed under the cups, and in despite of their use. Our readers will find these facts somewhat at variance with the opinions and inferences so confidently advanced and implicitly received, on the occasion of the experiments of Dr BARRY on poisoned wounds.

34. *Chlorine as a Preservative from, and Cure for the Plague.*—M. Leseps, the French Consul at Aleppo, has recently sent home an account of the great success attending the use of the chlorides, (as recommended by M. LABARRAQUE) for the prevention and cure of the plague. It is improperly, says the editor of the Journal General de Medecine (Dr A. N. GENDRIN), that we apply the term chlorides (chlorures) to what are in fact solutions of chlorine in alkaline waters. They operate as chlorine would do, with the additional advantage of rendering this latter more active than it would be in the gaseous state.

35. *Inoculation for the Plague, and the Protecting Powers of Olive Oil.*—While on the subject of the plague we must apprise our readers of the result of experiments performed by a Spanish physician, SARAFINO SOLA, at Tangier (Barbary) noticed in the Journal des Progrès. He obtained leave from the government, while the plague was raging at Tangier, to inoculate some Spanish deser-

ters, to the number of fourteen, with equal parts of sweet oil and the matter from pestilential buboes and carbuncles. The pus was taken from persons in whom the disease exhibited all its worst features: it was introduced by punctures with the lancet in twelve places on each individual, viz. three on each arm-pit and three on each groin. In seven of the fourteen submitted to the experiment, there was not the slightest trace of either local or general disturbance. In seven others, there was experienced, between the fourth and tenth hour after the inoculation, some inconvenience, such as in three a small pustule at the groin, in another a carbuncle on the seat; in three others some symptoms of general disorder and slight irritation in the vicinity of the incisions. They were then kept together in an apartment, and secluded from all intercourse with other persons; and as the symptoms had only just begun to manifest themselves, the oil was used by means of frictions externally, and swallowed. All recovered their health perfectly, without any other means being employed, most of them in twenty-four hours, the others in the course of the following day. Since that time they have enjoyed good health though daily exposed to infected persons.

Our readers will, after perusing the above account, if they have no prepossessions on the subject, be inclined to ask whether these facts go to prove how little the plague is contagious, or whether they are evidence of the prophylactic and curative powers of olive oil in the malady. How far also, we would ask, were the privations to which these deserters had been subjected, and their previous restricted diet, instrumental in rendering them little susceptible to the influence of epidemic and contagious diseases.

M. Graberg, the Swedish consul-general, who communicated the details respecting the inoculation, says "that the plague is never communicated through the medium of the open air, but always by the actual contact of infectious matters. People may be seized with the plague as often as they are exposed to the contagion, which could be well verified, during the last fourteen months, in many who had the disease three or four times in succession. To be infected requires a certain predisposition wanting to the half of mankind. Finally, cold and certain dry and strong winds diminish the force and limit the extent of the disease."

V. MEDICAL JURISPRUDENCE.

36. *Homicidical Monomania.*—It is now, says Dr GEORGET, from whom we propose again borrowing, more than thirty years since the celebrated PINEL proved that a sanguinary impulse may be accidentally developed in the most upright man, and lead him irresistibly to the most terrible excesses without reasonable motives. And yet this truth, clearly demonstrated by facts of the most unequivocal nature, has seldom had its due weight before the tribunals of justice, and is even still rejected by the judges as a fatal error.

The existence of an extraordinary variety of homicidical monomania, or of partial insanity prompting to manslaughter, has been more particularly contested. We can meet with few who are inclined at first to admit, that by an exclusive lesion of the sentiments or of volition, and without any disorder of the intellect, a man may be in such a morbid state, that he is impelled with violence to shed the blood of his fellow creatures, to destroy the dearest objects of his affections.

Dr ESQUIROL was for a long time inclined to doubt the possibility of homicidical monomania *without delirium*, or of that variety called *reasoning madness, mania without delirium, maniacal fury;* but of late years he has had occasion to become fully sensible of the correctness of PINEL's distinctions, and has given the subject a most profound examination, with the convincing addition of numerous pertinent facts. He now tells us that homicidical monomania is presented under two distinct forms. In the first, the murder is committed from a thorough but delirious conviction of its justness; by the exaltation of a bewildered imagination, by false reasoning, or by the passions in a state of delirium. The monomaniac is excited by an avowed and unreasonable motive, and

always presents sufficient evidence of a partial delirium of the intellect and affections.

In other instances, constituting the second form of the disease, the homicidical monomaniac presents no appreciable alteration of the intellect or affections. He is led by a blind impulse, by *an idea*, by *something indefinable* which impels him to kill; and even though his conscience warns him of the horrible character of the act which he is about to commit, yet volition being impaired is conquered by the violence of the bewilderment. The man is deprived of his moral liberty, he is a victim to partial delirium, he is monomaniac, he is mad.

Partial madness has not always, as its characteristic, the alteration of intellect. Sometimes the affective faculties are alone injured; at times the only disorder evident is in the actions. This is what authors have called *reasoning madness*.

In illustration of the first variety of homicidical monomania with delirium, this author relates the following history. "M. N. thirty-eight years of age, of a tall stature, yellow complexion, and spare habit of body, had been a gunner; he was then a journeyman. He had been subject to nasal hemorrhages, which had ceased for some months past. From that time forward, he became melancholy, and ceased to work. N. imagined that he was accused of having committed some crime; and in a fit of despondency, endeavoured to hang himself. He was bled in the arm and foot, and after other attempts at suicide, he was sent to Charenton. At first there was agitated manner, which disappeared in a few days; the patient continued sad and silent, with an uneasy look. He was put in the hall appropriated for those who had attempted suicide, in order that he might be the better watched. On the following day, and without any provocation, he struck the person next to him several times with the chamber utensil, threw himself on him and wished to kill him, in which he would have succeeded but for prompt interference. The patient was interrogated, and replied calmly that he heard his two brothers tell him to kill his neighbour, who wished to do him an injury. The next day N. seemed not to remember what he had done the evening before; he remained tranquil, sad and silentious after this event, as he had been before."

The forgetfulness of this act of violence on the following day, merits, says M. GEORGET, to be noticed, since it is an exception to the great majority of cases of mental alienation: hence M. ESQUIROL says simply that this madman *seemed* not to remember the act he had committed.

"There was," continues M. E. "some years ago, at the Salpétriere, a woman from the country, who wished to die, but who not having resolution to destroy herself, often said, 'I must kill somebody one of these days, that I may be made to die myself.' She had often attempted the life of her mother. When in the hospital, she endeavoured to kill one of the attendants, though this propensity was restrained by fear. She exclaimed frequently during the day, 'end my days, or else I will kill somebody.' She was much emaciated, did not eat, was sad, and had a fixed look."

All those monomaniacs, though acting under an erroneous idea and an error of judgment, have a known and avowed motive; they obey an impulse indicating reflection, and *even evince premeditation*. A very small number of them, after the commission of the fatal deed, *have sought to fly and to conceal themselves—all seem to have been conscious that they had committed a bad act*, except those who yielded to a religious hallucination. A close inspection of these persons enabled us to discover some corporeal derangement; sometimes there is evident disturbance of the nutritive functions.

Homicidical Monomania without Delirium. "We are unable (it is Dr E. who speaks) in this kind of insanity, to discover any intellectual disorder; the destroyer is carried away by an irresistible power, an influence which he cannot conquer, a blind impulse, a determination without reflection. We cannot conceive what prompts him without interest, motives, or intellectual bewilderment to a deed so atrocious and so contrary to the laws of nature."

In reply to the objections of those who consider this kind of monomania as a fiction, Dr E. asks, "whether the will may not, like the understanding and the

affections, undergo vicissitudes according to numerous circumstances in life? Have the child and the old man the same power of volition as the adult? Does not sickness enfeeble it? Do not the passions diminish or exalt it? If things be thus, why may not volition be subjected to disorders, perturbations, diseased conditions, however incomprehensible the change may be to us." In confirmation of these views he gives the following among other cases.

"Madame ———, aged 36 years, of a strong constitution, unequal disposition, an excellent daughter and tender mother, enjoyed until the fourteenth year of her age excellent health, at least to all appearances. She had a fulness of frame, though she had not yet menstruated. All the signs of puberty were well marked: at each menstrual epoch, or rather every moment, the young lady complained of headach; her eyes were red; she was restless, irascible, moody; her face would soon be as injected as her eyes; every thing was disagreeable to her, and became a cause of irritation; she sought a quarrel especially with her mother, and finally yielded to the most violent anger. In this state her mother was always the object of her passionate bursts, of her abuse, threats and maledictions. Sometimes she attempted suicide; on two or three occasions she laid hold of a knife, and once I withheld her thus armed, from rushing on her mother. When the paroxysm was at its height, blood escaped by the mouth and nose, and sometimes by the eyes; then followed tears, a general tremor, cold extremities, convulsive pain of all the limbs, succeeded by a long swoon. The state of suffering was of several hours' duration. During the first part of the paroxysm this young lady would roll on the floor, strike her head against the wall or the furniture; give herself violent blows with her clenched hand and scratch her face. Her physiognomy, generally very mild, became at such times hideous; the colour of her face, ears and neck was of a violet red. The head was burning; the extremities very cold.

"From the onset of the fit which lasted one or two days, the symptoms became more and more aggravated, until they reached their acmé. The countenance was at first moody, the complexion fresh, the disposition unequal, exacting, quarrelsome; a gesture, a look, a refusal was the cause of great discontent, and the slightest incident was speedily the occasion of a lively irritation of violent chagrin; finally her anger broke forth. Sometimes the symptoms would be obviated by attention, desire to please, by the arrival of a stranger, or the presence of an uncle who was much beloved. Frequently also the fit would go off in disagreeable and unjust complaints against the whole household. She would be particularly irritated against her mother, or a younger sister. Sometimes she would create occasions for dispute, in order to hasten the progress of the fit, and reach the period of anger. She did not suffer in this last state, whereas in that preceding it, she experienced the most atrocious pains, especially in her head.

"The paroxysm once over, Mademoiselle —— was dutiful to her mother, asked her pardon, and was prodigal of every mark of tenderness to her. I have frequently advised and urged her to overcome the first symptoms of the fit, and represented to her how reprehensible and dangerous her conduct was. She would then weep, and exclaim with bitterness, *Why have I been made thus? I wish I were dead; how miserable I am! I cannot restrain myself when I have reached my angry time: I no longer see any thing, nor know what I do, nor what I say.* She had not a remembrance of all the circumstances of her paroxysms, and denied, with a look of surprise and regret, the particulars related to her. At sixteen years of age, the fits of anger were often replaced by hysterical convulsions. The disease progressively diminished and ceased at her seventeenth year, when the menses appeared, though in small quantity. After marriage the nervous symptoms disappeared, though she menstruated irregularly and in insufficient quantity. On no occasion was there the slightest trace of intellectual lesion.

"This lady is an excellent mother and very good daughter; but she retains a disposition at times unequal and a tendency to melancholy."

Our limits will not allow of our introducing at this time additional cases, or of giving some very judicious reflections on homicidical monomania by Dr Esquirol. Enough has been said to direct the attention of our readers to a theme so

much abounding in interest to the medical jurist and moral philosopher. We shall return to it at a convenient season, recommending, in the mean time, all who have it in their power to peruse attentively the work of PINEL *sur l'Alienation Mentale*, and that of GEORGET *sur la Folie*.

VI. SURGERY.

37. *High Operation.*—M. SOUBERBIELLE presented to the Academy of Medicine the case of an octogenarian, on whom he had the same day performed the high operation, and removed twenty-one calculi, two of which were encysted. The patient bore the operation very well, and in this case as well as in several others, the urine escaped by the urethra and not by the wound.—*Rev. Med. Jan.* 1828.

Vide former volumes of this Journal for cases of this operation.

38. *Compound Luxation of the Elbow Joint.*—Prof. STEVENS of New York has recorded a case of this accident, successfully treated without amputation. —*New York Med. & Phys. Jour. No.* 25, *N. S. No.* 1.

The extremities of the ulna and radius were thrown behind the condyles of the humerus; the integuments in front were lacerated transversely to the extent of two and a half inches;—the tendons of the biceps and of the brachialis internus rent asunder;—the nerves stretched before the condyles of the humerus, and the brachial artery was torn and projecting from the wound. The hemorrhage was considerable: the lower end of the artery was not visible, but the upper extremity could be seen and was still pulsating. The orifice was contracted to the size of a crow quill, but not pervious. A ligature was applied to the torn artery at a point where its vascular communications remained. About an inch of the lacerated extremity was removed, and found to be filled with a coagulum.

The forearm was placed at right angles to the arm after reduction. No particular difficulty occurred; the pulse in the radial artery was felt on the third day after the accident, and a counter-opening became necessary for the discharge of pus at the lower part of the joint. The patient was discharged well in eight weeks, having a very slight flexibility at the elbow, and perfect command of the hand and fingers.

39. *Amputation at the Elbow Joint.*—Dr J. KEARNEY RODGERS, Surgeon to the New York Hospital, amputated at the elbow joint in November last, for a severe gun shot wound of the forearm. No fever and no unusual symptoms supervened; the wound was found united in two days, except in the course of the ligatures. In three weeks, the ligatures came away, leaving the stump sound and more useful than when the ordinary place for amputation is selected.—*Ibid.*

40. *Imperforate Vagina.*—M. VILLAUME of Metz reported to the French Academy of Surgery the case of a young female, whose life was in great danger from a gradual accumulation of the menstrual fluid in the uterus in consequence of an imperforate vagina. Her illness commenced at fourteen years of age; and at sixteen years old, the abdomen was of the size of a female advanced in pregnancy. The external organs were natural; the hymen even existed, but a dense cellular mass occupied the situation of the vagina. A cautious dissection was made between the urethra and rectum, avoiding each of these canals, to the body of the uterus, which was then punctured. A bloody discharge commenced, and continued for several days to the relief of the patient. The canal became fistulous and gave issue to the menses, and, during the interval of the menstrual periods, to an abundant leucorrhœa.—*Nouv. Bibliotheq. Jan.*

41. *Ligature beyond the Tumour; Mrs Denmark's Case.*—Vide last number

of this Journal, p. 466, for the continuation of the interesting case of Mrs D. whose right subclavian artery was tied by Mr WARDROP for an aneurism of the arteria innominata, and of whose subsequent condition such opposite accounts have been given. Dr JOHNSON reports the patient alive on the 14th of January. On the 5th the aneurismal tumour was again taking an outward direction—the clavicle was again rising and becoming dislocated, and in short the poor patient was nearly in the same pathological condition as before tying the artery beyond the aneurism. January 14th, clavicle still rising, breathing very bad, though not so much so as at one or two periods within the last weeks, and no pulsation could be felt in the right radial artery since the 27th of December.

We have not seen any account from Mr WARDROP later than the 5th of December. In our next number, the result of the case will probably be given.

42. *Traumatic Tetanus.*—In the peninsular war, Dr BARRY tried, with success, in tetanus from wounds, alternate doses of carbonate of soda and opium. HUFELAND has reported a case illustrating this practice—copied by the Revue Medicale and also by the Medico-Chir. Review for April, from which we condense the following account. A healthy young woman was seized with tetanic symptoms, a month after receiving a contused wound on the instep of the left foot and before the wound had healed. The ulcer was in a bad condition.

Thirty-two ounces of blood were abstracted, purgatives given and a poultice applied to the ulcer. Bowels being opened, "*the method of* STULTZ" (so this practice is termed) was adopted, and in the course of twelve days, 224 grains of opium were given in alternate doses with carbonate of potash: the quantity of the latter is not mentioned. The spasms became less severe and frequent, till a general swelling of the body came on, when they ceased altogether. The swelling seemed to be anasarcous, and disappeared under the use of diuretics, but was followed by an eruption on the skin resembling scarlatina. The patient eventually recovered.

43. *Inguinal Aneurism—External Iliac tied.*—The external iliac artery was secured on the 21st of February 1828 by Mr BRODIE, for a large aneurism of the femoral artery, apparently extending the whole length of the artery. Pressure on the external iliac, before the operation, arrested the pulsation; whilst pressure on the superficial femoral below the aneurism lessened the pulsation, but had little or no effect on the tumour. When the silk ligature was tied, the pulsation ceased, and did not return; but the size of the tumour was not much reduced at the time: since, it has steadily decreased. The ligature had not come away at the last date (March 8th).

Mr BRODIE operated on ABERNETHY's plan in preference to sir ASTLEY COOPER's for several reasons: he had twice adopted the former operation with success, and therefore it was more easy to him. There was reason to believe the lower portion of the artery was diseased; hence the higher the ligature is applied, the safer. In sir A. COOPER's operation there is danger of wounding the epigastric artery; an accident which happened in 1821 to M. DUPUYTREN, the patient dying of peritoneal inflammation.

Another objection to COOPER's operation is that the ligature is applied just above the giving off of the epigastric and circumflex ilii, and hence the internal coagulum is short, and secondary hemorrhage more probable. A patient of DUPUYTREN's was greatly exhausted by a secondary hemorrhage from the lower portion of the artery, and on examination, the epigastric artery was found enormously enlarged and to have brought the blood into the femoral, almost to the verge of the ligature, on the separation of which, rupture and hemorrhage ensued. In another case, sir A. COOPER secured the artery *immediately below* the origin of the epigastric and circumflex arteries, and secondary hemorrhage followed. The same thing happened to Mr CLINE, and lately at St George's Hospital dangerous hemorrhage followed the coming away of a ligature from the femoral artery a little below the giving off of the profunda.—*Medico-Chirurg. Rev. April.*

44. *Exuberant Callus, dissipated by means of a Seton.*—This case is reported by professor C. A. WEINHOLD of Halle. John X. R. aged eighteen years, fractured the os femoris near its middle, and was treated by a neighbouring surgeon in the ordinary way, to the end of the fourth week. He then returned to his work in the country. At the expiration of ten weeks, the limb was shortened two inches, and the callus augmented to the size of a child's head. He came under the care of Dr WEINHOLD. The callus was eighteen and a half inches in circumference; the cellular tissue, above and below the tumour, was loaded with lymph, and abscesses and fistulæ had formed. Extension and counter-extension were tried for eight days; but as three months had elapsed since the accident, no mechanical measures would prove effectual. Determining not to abandon his patient, Dr W. decided on perforating the callus, and to carry through it a seton imbued with stimulating substances, to excite inflammation and suppuration of the bone, and finally the softening and absorption of the callus, that he might restore the bone to its original length by regular and judicious extension. On the 11th of November (year not given), Dr W. prepared a sharp-pointed drill, mounted on a whimble, and pierced the soft parts with the point of the instrument, which was then gently turned until he perforated the external layers of the callus: he then traversed, suddenly, a cavity, four inches in depth before reaching the opposite side. This was then perforated and finally the muscles and skin, and the seton was introduced: not more than an ounce of blood was lost. For three days, the part was covered with cold cataplasms. On the 4th day, the seton was imbued with the balsam of Arceus, and was drawn across the wound twice a day. Suppuration in the cellular tissue was very abundant during the 5th week, the pus being discharged at openings above and below the callus. These fistulæ were cured by pressure, a short time after the induration of the cellular tissue had been dissipated. At the end of the 6th week, the callus was very painful, and its temperature augmented, which symptoms were dissipated by cold poultices. In the 7th week, the long desired suppuration of the callus occurred, and on pressure with the finger, a large opening was felt which indicated that the favourable time had come for employing extension. This was persevered in, and during the 10th week, the limb became so much lengthened as to be only two lines shorter than its fellow. The seton was continued to the 12th week; it was then removed and the wound cicatrized. Some weeks after, the callus was considerably diminished, the patient walked without crutches, and the affected thigh presented nearly the same size and appearance as the sound one. *Journal des Progrès, Tome VIII.*

45. *Case of Contraction of the Canal of the Larynx relieved.*—Elizabeth Oswald, æt. 27, in attempting suicide in September 1826, wounded the crico-thyroid ligament. She recovered with the loss of voice and with a fistula of the larynx through which she breathed. On the 15th of April 1827, Mr LISTON, having examined the neck and discovered a very minute orifice leading towards the glottis, began to introduce bougies, about the size of darning needles, into the part of the larynx above the wound; by gradually increasing the size of the bougies, the passage was brought about the end of June to its natural diameter. About the middle of August, the lower part of the trachea was dilated by a tube, gradually increased in size, so that one of sufficient diameter might be passed by the mouth. Three weeks afterwards, the short tube was removed, and a long one was introduced by the wound up into the mouth, there laid hold of, and pushed down into the trachea. Severe coughing for half an hour was thus excited. This tube, nine inches long and equal in diameter to the largest æsophagus tubes, was retained in the windpipe for fifteen days, during which it excited great salivation, loosened the teeth and extremely reduced the patient's strength.

To close the wound, the cicatrix was, on the fifth day after introducing the tube, dissected out by two elliptical incisions, and the edges of the wound united by suture. The tube being removed on the 15th day, she breathed well. In the morning, however, her breathing became very difficult, and *tracheotomy* was

performed. A silver tube was introduced and retained for five days; but was then replaced by a smaller one.

The actual cautery was applied to the edges of a small sinus which remained on October 17th; and on the 26th it was reapplied to the opening, which had nearly closed. On the 28th the tube was removed; and a few days after the wound was completely closed. The woman now breathes with comparative ease through the larynx, and is slowly recovering the use of her voice.—*Ed. Med. and Surg. Jour. Jan.* 1828.

46. *Traumatic Tetanus.*—In the Nouvelle Bibliothéque for March, three interesting cases of traumatic tetanus are given, in which cold affusions appeared to be instrumental in saving the lives of the patients. In each, there was a horror of this remedy, and in each the affusions were repeated, until a state analogous to syncope was induced. The patients were then put to bed, and carefully rubbed with warm flannels, while warm wine and paregoric were administered. Reaction was thus induced with great relief to the spasms. The affusions were to be repeated, and the disease was completely subdued in eight days. Other treatment, such as with mercury, camphor, laudanum, cathartics, &c. was employed, but evidently with no advantage, excepting by facilitating reaction and calming the mental agitation of the patient. The cases were presented to the Atheneum of Medicine at Paris, by Dr Doucet, and occurred in different parts of this country (America). The first was a man of a robust constitution, 37 years of age, with traumatic tetanus from a wound of the big toe, which had completely cicatrized on the 24th June 1823. On the 26th, the tetanic symptoms were well marked. On the 28th, cold affusions were employed; after opium, calomel, and injections had been ineffectual. They were repeated occasionally as the patient's consent could be gained, and he was quite well July 12th.

The second case was also a male of good constitution, 22 years of age, affected with the disease at Montreal, July 1806. Cold affusions were employed and he was cured in 13 days.

The third case, a robust man, 34 years of age, was cured at the end of eighteen days.

In none of these cases were the cold affusions resorted to as frequently as was desirable, owing to the repugnance of the patients; but they always appeared to be advantageous, and of course would have effected a cure sooner if they had been more diligently employed. The following authorities are quoted by the author as sanctioning the practice: Cullen in his Practice of Medicine; M. Fournier Pascay, Dictionnaire des Sciences Medicales; Dr Harris of Pennsylvania, New Medical Repository, Vol. 3; Dr Archer of Maryland, Id. Vol. 9; Dr Prioleau of South Carolina, Amer. Med. and Philosophical Register, Vol. 3: Dr Wright of Jamaica, Dr Dover at Cayenne, and Dr Rush of Philadelphia, are cited by Dr Valentine in Jour. General de Med. Vol. 40, as having used cold affusions with advantage. So also several English physicians, as Hunter, Currie, and Darlyng, vide Thomas's Practice, and Edinburgh Journal, 1807. In a work published at Paris, entitled *Precis sur le Tétanos des Adultes*, Heurteloup recommends the cold bath; and that the individual, on leaving the water, should be placed in a bed well warmed, and take a glass of wine, or ten or twelve drops of the aq. ammoniæ, in a few spoonsful of water. He cites a case exhibiting the good effects of this treatment.

47. *Amputation of the Lower Jaw.*—This operation has now been so frequently executed with success, that surgeons are directing their attention to the best means of preventing, as much as possible, the subsequent deformity. The enterprising and active surgeon, M. Lisfranc, in November last, extirpated the left portion of the lower jaw from the chin to the ramus, for a sarcomatous tumour involving the bone, extending under the tongue, and contaminating, in a slight degree, the lymphatic glands. To prevent deformity, M. Lisfranc, instead of making the ordinary transverse incision across the cheek, made a perpendicular

cut from the middle of the free border of the lip to the base of the jaw, dividing all the soft parts to the bone. The incision was continued an inch further in the same direction; it was then made transversely from before backwards to a point one quarter of an inch below and before the angle of the jaw, and extending only through the skin and cellular tissue. The flap thus formed was dissected upwards, and the bone and diseased mass extirpated in the usual manner, without any troublesome hemorrhage. The fluids from the mouth and wound had a free outlet in a depending position; part of the wound healed by the first intention, part by granulation; and a fistula, kept up by the discharge of saliva, &c. was formed on the side of the neck. M. LISFRANC succeeded in curing it, by placing in the mouth, at a point corresponding to the external orifice, a small piece of sponge which absorbed the fluids that retarded the cure. The sinus then healed in four days. Little deformity resulted; the cicatrix being nearly covered by a cravat. The left side of the jaw is but slightly depressed; while the right side has deviated a little to the left, but can easily be replaced in its ordinary position. The left ramus of the bone is carried a little inwards. The patient speaks with much distinctness and can take solid food.—*Revue Med. March*, 1828.

48. *Artificial Anus cured.*—Professor GRAEFE, of Berlin, has successfully managed an artificial anus resulting from a sloughing inguinal hernia. Uninterrupted dorsal decubitus, cleanliness, occasional closure of the orifice by pledgets of lint, liquid aliment, and the daily administration of two laxative enemata, were so effectual, that in six weeks, the flow from the fistula ceased and the external orifice was closed by pressure. In two months and a half, the patient was perfectly well.—*Revue Med. March.*

49. *Cancers of the Skin.*—M. GRAEFE has successfully employed, in cancers of the skin, a mixture of the perchloride of mercury (corrosive sublimate) with the mucilage of gum arabic. This liniment forms an application much more easy, and more efficacious than all the usual pomatums, powders, &c. It may be allowed to dry on linen or pieces of lint, and thus be introduced into narrow fistulæ, and be applied to the smallest spot without fear of any injurious consequences.—*Revue Med. March.*

50. *Traumatic Epilepsy cured by Trephining.*—We have been favoured by the editors, with the first number of the Transylvania Journal of Medicine, and have been much pleased with the contents of this new western periodical.

The first paper is from the distinguished western surgeon professor DUDLEY, in which are many valuable cases and observations on injuries of the head. Our limits will allow of but a short summary of a few cases of epilepsy following blows on the head, relieved or cured by trephining; and we regret that we cannot offer some of the author's deductions, which, although not original, are opposed to some leading opinions of the day.

In December 1817, Mr K. suffered pain in the upper part of his head. This continued; and in September 1818, he consulted Dr. D. About Christmas epileptic convulsions came on, and on the 16th of April 1819, he was trephined where the bone appeared to be depressed, and where several tumours had formed. The pericranium was thickened and very sensible; the bone porous, and very firmly adherent to the dura mater over the longitudinal sinus. The dura mater was found separated from the brain by a fluid deposition, so that the pulsation of the brain was not evident. On the fifth day, suppuration was free; the fluid under the dura mater was absorbed, so that the brain had regained its proper level and pulsated with unusual vigour. A mercurial course was prescribed. Two slight attacks of epilepsy supervened, but in three months he was dismissed well. Subsequent observation induced Dr D. to regard the cure as radical.

W. T. when five years old had a blow on the parietal bone, followed by concussion, apoplexy, and paralysis. In two months he recovered his mental and corporeal powers. He became subject however to severe cephalalgia and was weak and delicate. At fourteen years of age he was seized with convulsions. His

general health improved, but his mind failed, and he was removed from school. In the spring of 1825, Dr D. was consulted, the patient being then 21 years of age, with impaired memory, judgment, &c. On the 10th of May, the parietal bone was trephined where a depression existed. A spiculum of bone, about one inch in length, was found projecting from the inner surface of the cranium. It penetrated the dura mater, and communicated with a large preternatural sinus, "from which issued a stream of blood as thick as a man's little finger, which continued to flow until it was judged proper to check it by means of pressure." The dura mater was diseased and of a dark colour. A convulsion supervened, during which "a stream of blood issued through the opening in the dura mater that projected three or four feet." Two more fits followed with like discharges of blood. For three days and nights large quantities of serous fluid were evacuated from the wound. 4th day. Dressings were dry, suppuration followed. In 30 days, the wound was healed. No convulsion came on after the operation. His mental and bodily faculties recovered their activity, and in July, six weeks after the operation, he returned home in perfect health. With the exception of one fit, excited by dancing and by excess in eating and drinking, he has remained well.

Gofourth, when 5 years old, had an injury of the parietal bone: suffered few bad symptoms until 15 years of age, when epilepsy supervened. The paroxysms returned every three or four weeks, and at the age of 23 he was imbecile in body and mind. In February 1826 Dr D. trephined him on the parietal bone. Much serum escaped during the operation. The dura mater was found deficient to the extent of a twelve and a half cent piece of silver, which exposed a sinus extending to the petrous portion of the temporal bone. A spinous process projected about half an inch from the internal surface of the bone. The sinus in which the serum was collected was large enough to receive a hen's egg. On the second and third days two slight attacks of epilepsy. On the 4th suppuration took place. Improvement of mind and body was daily manifested and at the end of the fourth week, the wound was cicatrized and the patient returned home quite well. During the summer he was employed as a fireman on board of a steam boat on the Mississippi, and in August reported himself as quite well.

In two other cases, the operation was performed with much advantage; but the recovery was not quite complete, perhaps owing to subsequent neglect. One, O'Brien, received in 1822 a blow on his head, by which he was deprived of motion and intellect for several weeks. He afterwards suffered from severe convulsions and almost constant pain. He spoke with difficulty—senses of taste and smell very nearly destroyed—all his muscles seemed preternaturally contracted. The operation was performed: dura mater very vascular; no other apparent alteration about the wound: but towards evening patient said his limbs were "unlocked," and there was a perfect relief to the organs of speech. On the third day suppuration ensued, and the pain and other symptoms disappeared; but on the sixth day, a convulsion supervened. His appetite became ravenous, which he often indulged. His general health improved. He was able to walk out; his mind was not perfectly correct; he had some slight convulsions; withdrew from his medical attendant and has not since been heard of.

Froman consulted Dr D. in April 1827, having fifteen years previously had a fracture of the superior and posterior portion of the parietal bone. His memory was immediately impaired; in two years convulsions supervened and finally fatuity. The operation was performed: bone and dura mater healthy; no pulsation in the brain, owing evidently to effusion under the dura mater. On the fifth day suppuration was established; and the brain was now found at its proper level, the fluid having been absorbed. For two weeks, all was flattering. The convulsions however returned and continued; but were reported to be less frequent and more mild than previous to the operation.

These cases with others on record are certainly very encouraging, and show, as Dr D. observes, that the operation of perforating the bone is not in itself very dangerous, especially when the patient has the advantage of a good constitution and a pure atmosphere.

We would recommend the whole of Dr DUDLEY's paper to attentive perusal,

although we believe he carries some of his rules rather to an extreme. In our first volume, p. 183, will be found a notice of similar cases from sir A. Cooper; and in our second vol. p. 204, the case in which Dr Rogers of New York successfully operated under similar circumstances.

VII. MIDWIFERY.

51. *Cæsarian Operation.*—A young woman of a frail, rachitic temperament, was admitted into the hospital at Florence in Italy, on the 13th May 1827, at 10 o'clock, A. M. She had been in labour for sixty hours at the full period of utero-gestation; pains unfrequent, os tincæ dilated, the membranes ruptured, the umbilical cord protruding at the vulva without pulsation, and the fœtus without motion for six hours. The antero-posterior diameter of the superior strait was so much diminished, that the physicians decided on the necessity of the Cæsarian section. This was executed in the usual manner and a full grown but dead fœtus was extracted. A pledget was interposed at the inferior portion of the wound; the remainder was closed by fine sutures.

Evening. Fever; was bled to ℥xii, and during the night again bled to ℥ix.

2*d day.* Fever, vomiting, cephalalgia, ischury. Catheterism, two bleedings each to ℥viii, enema, diluents.

3*d day.* Symptoms continued. A fifth bleeding, catheterism, injections.

4*th day.* Better. Constipation remains. Ol. Ricini, ℥ss, produced abundant liquid and yellow stools.

5*th day.* Return of fever, abdomen tympanitic, and painful on pressure, lochiæ suppressed, cephalalgia, dryness of pharynx. A sixth bleeding, to ℥viii, relieved. Suppuration at the wound.

6*th day, and early on the* 7*th.* Amelioration of symptoms—return of lochiæ, lancinating pains in the mammæ. *At night.* High fever; was bled twice, once ℥iv, the second ℥ii.

8*th day.* Better. Wound suppurating at inferior part; the rest united.

Patient continued to improve, and on the 30th day left the hospital quite well. —*Annali Universali, Milano.—Revue Med. Jan.* 1828.

52. *Arm and Shoulder Presentations.* Dr Robert Lee read a short paper before the Westminster Medical Society on the 5th of January, recommending the sacrifice of the child in cases of arm and shoulder presentations where turning was unadvisable or impracticable. When we have proof that the child is dead,—that the pelvis is too small to allow a living child to pass—or that there is great improbability of bringing a living child into the world, even by turning, we are advised to disjoint the arm, at the shoulder, introduce a blunt hook, so as to take hold of the spine as low down as possible,—and bring away the fœtus double—thus imitating the operations of nature, in some cases of spontaneous evolution.—*Medico-Chirurg. Rev. April.*

53. *Birth of Five Children at one Accouchement.*—Dr Weiss records the case of a female aged 27 years, married for five years, and having two years previously given birth to twins, being brought to bed of five children; two boys in succession, then one girl, afterwards a third boy, and finally, a girl. Each child had its own membranes and placenta. They were all regularly formed, but not full grown, and had the appearance of old age. They slept continually and their temperature was inferior to that of new-born infants. None of them lived beyond the third day. The mother did well.—*Arch. General. March.*

54. *Retention of the Placenta.*—Dr And. Primus relates the case of a female, confined with a dead infant on the 25th of January. The midwife could not succeed in bringing away the placenta, and in her attempts ruptured the cord. The placenta remained,—no contractions and no hemorrhage supervened; never-

theless the woman enjoyed perfect health until the 14th of May following, when some hemorrhage and colic pains came on. These re-appeared on the 22d of the same month with more severity, and were followed by the expulsion of the placenta.—*Archiv. General. May.*

55. *Diseases of the Placenta.*—M. BRACHET believes that the placenta is liable to the same diseases as other organs, and that they are excited by similar causes; that of these affections inflammation is the most common, terminating by schirrus, suppuration and organic adhesion; that the different kinds of concretions, whether osseous, calcareous, hydatids, &c. exist independently of inflammation; and finally, that the diagnosis of these diseases is very obscure, and often cannot be determined. Inflammation can sometimes be detected and may be treated on rational principles.—*Jour. General, Jan.* 1828.

A case has lately occurred to one of the editors of this Journal, which may be referred to inflammation. A female, the mother of several children, was delivered, in June 1827, of what she deemed a false conception. Her menses returned three or four times at the regular periods, and she again had the usual indications of incipient pregnancy. She, however, never quickened; suffered more than usual uneasiness; complained much of pain in her back, hips and thighs, and often of a burning sensation in the region of the uterus. She went to what she considered the eighth month of gestation, and was delivered, after a short but severe labour, of what at first view, appeared a mere fleshy mass. On examination, this mass was found to consist of a fœtus and its appendages. The fœtus was about three months growth, of a chocolate colour, surrounded by ℥iii. of a chocolate coloured fluid, and enveloped in its membranes, having the same dull brown colour. The smell was unpleasant and the membranes tore readily. The placenta formed the largest portion of the mass, was much indurated, and had the fresh colour of tumours lately separated from the living body. It would appear that the child died about the third or fourth month of gestation; but that the placenta continued to live to the eighth month, and was affected, before or after the death of the fœtus, with inflammation. Does not this case confirm the opinion, that the organic life of the placenta, both fœtal and uterine portions, depends on the parent, and not in any measure on the child?

56. *Puerperal Peritonitis cured by Ice.*—A female was seized with severe symptoms of peritonitis on the fourth day after parturition. She was bled to ℥xvi; ice water for drink, and ice to the abdomen. In three hours, the severity of symptoms was diminished; thirst and vomiting had disappeared; abdomen less tumid, and pressure less painful. In the evening, amelioration still greater; the belly quite soft; a natural stool occurred, and the patient had some sleep. The application of ice was alone continued, and next day perspiration came on. The mammæ filled with milk; the lochiæ soon appeared, and in four days no symptom of peritonitis remained.—*Archiv. General. for Jan. from the Jour. of the Roy. Soc. of Med. at Toulouse.*

VIII. CHEMISTRY AND PHARMACY.

57. *Bromine, an Elementary Body.*—Facts of a convincing nature, having been presented to the French Academy of Medicine, going to show the elementary nature of bromine, that learned body decided, that the assertion of M. DUMAS, that bromine is a compound of chlorine and iodine, should be considered as retracted, and ordered that an entry to that effect should be made upon the minutes.

58. *Discrimination of Bromine from Iodine.*—M. POMIER, an apothecary of Salies, Lower Pyrenees, conceives that from the numerous analogies between

bromine and iodine, these bodies are liable to be often confounded. He states that starch becomes of an intense crimson colour by the action of bromine; while, as is well known, it strikes a blue colour with iodine.—*Nouvelle Bibliothèque Médicale, Dec.* 1827.

59. *Discrimination of Baryta and Strontia from one another.*—MM. JULIA-FONTENELLE and QUESNEVILLE communicated to the French Academy, on the 11th of Feb. 1828, a very simple method of distinguishing baryta from strontia. If, upon the addition of a few drops of sulphuric acid, the doubtful earth becomes red hot, it is strontia.

60. *New Variety of Borax.*—In the Journal de Chimie Médicale, for April last, we find an interesting memoir on borax, by M. PAYEN.

In his manufactory for purifying borax, the author observed an octohedral variety, harder and heavier than the ordinary prismatic salt. Upon making a comparative analysis of the two kinds, he considers the prismatic variety to consist of

2 atoms	Boracic Acid,	70.4
1	Soda	31.27
10	Water	90

and the octohedral variety of

2 atoms	Boracic Acid	70.4
1	Soda	31.27
5	Water	45

The above are deduced proportionably from M. PAYEN's numbers, by deducting one-fifth from each, so as to make them conform with the hydrogen unit, which is most familiarly known in the United States. It is seen above, that the ratio of BERZELIUS's number for soda (adopted in France) to that for oxygen, is not the same as that admitted in England and America. According to the English chemists, it is 32. Disregarding the water, and deducing the proportion of the boracic acid on the assumption that soda is represented by 32, then we have M. PAYEN's experimental proportions expressed thus:—

Boracic Acid	72.04
Soda	32

Now Dr THOMSON (First Princ. Chem. II. 270) gives these proportions:

2 atoms	Boracic Acid	48
1	Soda	32

The discrepancy between these analyses is very great; but they may be reconciled in the following manner. It is well known that the borax of commerce is a salt in which the alkaline property prevails, and hence, it is generally called subborate of soda. This is the salt analysed by Dr THOMSON. Now, M. PAYEN conducted his analysis by *saturating* a pure boracic acid with carbonate of soda. May it not have happened that the experimenter obtained a compound, containing a larger proportion of acid than exists in ordinary borax; and that the difference between his analysis and Dr THOMSON's may depend on this circumstance? Whether this conjecture be worthy of any attention or not, it is at least certain, that assuming the quantity of boracic acid obtained by Dr THOMSON to be two atoms, the quantity found by M. PAYEN corresponds with remarkable precision to three atoms; for three times 24 make 72.

We would, therefore, suggest, that M. PAYEN is probably wrong in considering the quantity of boracic acid which he obtained as corresponding to two atoms.

61. *Artificial Ultramarine.*—GAY-LUSSAC announced, at a meeting of the French Institute, held on the 4th of Feb. last, that M. GUIMET has discovered a method of forming ultramarine of every variety, by availing himself of the data, furnished by the analysis of the lapis lazuli, performed by MM. DESORMES and CLEMENT. The artificial product has a richer tint, and is more brilliant than the natural ultramarine. The Society of Encouragement had offered a prize for this

discovery, of which the committee of the chemical arts had foreseen the possibility.

62. *Analysis of the Water of the Dead Sea.*—In the Journal de Chimie Médicale, there is given the following analysis of the water of the Dead Sea, by CH. GMELIN.

Chloride of calcium,	3.22
Chloride of magnesium,	11.77
Bromide of magnesia, [?]	.44
Chloride of sodium,	7.08
Chloride of potassium,	1.67
Chloride of aluminum,	.09
Chloride of manganese,	.21
Muriate of ammonia,	.01
Sulphate of lime,	.05
	24.54
Water,	75.46
	100.00

This analysis is interesting, as embracing the newly discovered element bromine.

63. *Analysis of Human Milk by* M. PAYEN.—Seven hundred and seventy-five grains of milk, taken in the seventh month of lactation from a healthy woman, contained

Water	666.5
Fatty matter	39.9
Caseum, and traces of insoluble salt	1.4
Sugar, soluble salts and traces of an azotized matter	59.0
	766.8

This analysis gives 13 per cent for the solid matter contained in human milk.

Two additional analyses of human milk, by M. PAYEN, give nearly the same result; the solid matter, varying from 13 to 14 per cent.

Compared with goat's milk, woman's milk differed in possessing a decided alkalinity, and in containing about half as much caseum.—*Journal de Chimie Médicale, Mars* 1828.

64. *Reduction of Silver from the Fused Nitrate.*—A. CHEVALLIER has given a note on this subject, in the Journal de Chimie Médicale for 1827. It is well known, that copper precipitates the silver from a solution of nitrate of silver. But M. CHEVALLIER has observed the novel fact, that the same decomposition takes place in the dry way. Thus a stick of lunar caustic, being placed on one of its extremities on a plate of copper, was totally decomposed, without losing its shape. M. CHEVALLIER was led to make this observation, in consequence of being consulted by a physician, on the cause of the inactivity of lunar caustic, held in a port-caustic made of copper.

65. *Action between Nitrate of Silver and Linseed.*—Apothecaries in France are in the habit of keeping the fused nitrate of silver in linseed. It would seem, however, that this is an improper practice; for M. DULONG has proved, in a memoir communicated by M. HENRY to the Section of Pharmacy of the French Academy, that these substances act upon each other, even without the aid of moisture. When the substances are dry, the mutual action is indeed slow; but nevertheless, an appreciable quantity of the fused nitrate is absorbed by the organic matter of the seeds, whereby minute excavations are formed on the surface of the cylinders of the nitrate.

Others seeds have the same effect. M. DULONG has observed certain coloured rings on some grains of linseed, which had been touched with the fused nitrate, and considers the appearance to be an electro-chemical phenomenon. It is very important, according to this chemist, to avoid employing, in pharmaceutical operations, metallic vessels fabricated of more than one metal.

On the communication of this memoir from M. DULONG, M. ROBIQUET took occasion to mention, that M. DEYEUX had seen a case in which death was produced by the internal use of linseed, in which fused nitrate of silver had been kept.

66. *Method of Detecting Opium.*—In the Journal de Chimie Médicale for February 1828, M. ORFILA gives a note on the method of Dr HARE (misspelt HAVE) for detecting minute quantities of opium, originally published in the Philadelphia Journal of the Medical Sciences. This method consists in precipitating a meconate of lead by acetate of lead, liberating the meconic acid by sulphuric acid, and then adding a solution of persulphate of iron, which will produce a characteristic red colour. The Parisian professor has repeated Dr HARE's process successfully; and remarks that it is preferable, without explaining why, to wash the meconate of lead on a filter, to decompose it by sulphuric acid, and filter anew to separate the sulphate of lead, and then to act on the persulphate of iron by the meconic acid, after passing the filter.

The examination of Dr HARE's method led M. ORFILA to try another process, which he conceives to be more simple. He remarks, that as it is only necessary to have meconic acid in a free state for the persulphate of iron to strike the red colour, it must be clear that by acting directly on the meconate of morphia, existing in opium, by sulphuric acid, the meconic acid will be liberated, and, on the addition of a salt of iron, will undergo the characteristic change of colour. Now M. ORFILA states this to be the fact; and further, that as the persulphate of iron always contains an excess of acid, the simple addition of the ferruginous salt is sufficient to redden the infusion of opium, laudanum, or the solution of the watery extract. M. ORFILA subjoins to his remarks the following experiments.

1st. A grain and a half of SYDENHAM's laudanum (vinum opii), diluted with three ounces and a half of water, were mixed with some drops of persulphate of iron: the colour was changed from a light yellow to red. To appreciate the change of colour satisfactorily, it is best to examine the liquid comparatively with another portion, to which the ferruginous salt has not been added.

2d. With three grains of laudanum, and the same quantities of water and persulphate of iron, the red cloud was very distinct.

3d. The fourteenth of a grain of opium, diffused in four ounces of distilled water, and allowed to remain for ten minutes, produced, on the addition of a few drops of persulphate of iron, an evident red cloud. With the seventh of a grain of opium in the same quantity of water, and tested with the same amount of the persulphate, the red colour was very distinct.

4th. Similar results are obtained, when the fourteenth or eighth of a grain of the aqueous extract, dissolved in water, is used.

M. ORFILA considers these experiments as proving,—1st. That the persulphate of iron is a very delicate test for meconic acid, contained in opium, the watery extract of this substance, and laudanum; 2d. That it is not necessary, as directed by Dr HARE, to treat these substances with the acetate of lead and sulphuric acid, for the purpose of developing the red colour on the addition of the persulphate of iron, but that it is sufficient to act directly on the opiate preparations with this salt; 3d. That Dr HARE is wrong in regarding the persulphate of iron as a means of detecting minute quantities of opium in solution; as this salt can be only considered as a reagent, no doubt very important, to be added to those heretofore employed, for ascertaining the presence of morphia [meconic acid?]. It would be reprehensible in any one to affirm in a court of justice that a matter contained opium, *merely* because it was reddened by the persulphate of iron.

On the above observations, we have only one remark to make. It may be true

that the method, proposed by Dr HARE, does not, strictly speaking, detect *opium*; as the agent which he employs acts on one constituent only of opium, and this constituent may possibly be present, either uncombined in a fluid, or in some unusual state of combination. The peculiar colour produced by the test, therefore, strictly speaking, only demonstrates the presence of meconic acid; while we have the violent presumption, that it is associated with opium in some form or other.

67. *Extraction of Morphia without the use of Alcohol.*—On the 9th February last, MM. HENRY, Jun. and PLISSON communicated to the Section of Pharmacy, a process for extracting morphia without the use of alcohol. It is founded on the fact of the facility with which morphia, mixed with narcotin, may be separated by the action of very weak muriatic acid. The liquor exhibits hardly a sensible acidity, when the morphia is held in solution as a muriate, while the narcotin is not sensibly dissolved. The following is the process:

Treat a pound of opium, at a gentle heat, with twice its weight of distilled water, acidulated by muriatic acid. Repeat this treatment three times, and after having concentrated the filtered or decanted liquors to two-thirds, add a slight excess of liquid ammonia of 12°, or of caustic hydrate of soda of 2° or 3°. Collect the precipitate, (which consists of resin, caoutchouc, narcotin, morphia, and a little extractive) wash it, and treat it repeatedly at a gentle heat with a very weak muriatic acid, so long as this acid takes up any thing, allowing it to be in slight excess. The yellow liquor obtained by the action of the acid, and which contains muriate of morphia, a little resin, and colouring matter, is then heated with animal charcoal, and evaporated to the point of crystallization. The crystals are to be twice purified by new crystallizations, and the mother waters to be concentrated and decomposed, as often as may be judged necessary. The crystals of muriate of morphia, obtained after three crystallizations, being dissolved in a small quantity of acidulated water, are decomposed by a slight excess of ammonia of 12°, and the morphia which precipitates is collected. In this state, it is sometimes slightly yellowish; but it is free from narcotin, and furnishes handsome crystals by means of alcohol and charcoal. When saturated with muriatic or sulphuric acid, it forms very white and well crystallized salts, which are much more readily prepared than the same salts, formed by saturating crystallized morphia, which is difficultly soluble in alcohol and the acids.

MM. HENRY, Jun. and PLISSON, having alluded to the remark of DUBLANC, Jun. and PELLETIER, in regard to the inconstant action of the acetate of morphia as usually prepared, it being in fact a variable mixture of real acetate and morphia,—propose to substitute for this salt the sulphate or muriate, both of which salts crystallize readily, and are easily identified.

68. M. GIRARDIN's *Process for Morphia.*—This process was detailed to the Section of Pharmacy of the French Academy of Medicine, by M. HENRY, Jun. It is as follows:—Exhaust opium by hot water, and reduce the liquors obtained to one-third. When cold, add an excess of ammonia. The precipitate produced is collected, dried, washed with weak alcohol, and treated with sulphuric ether. The residue is then dissolved in sulphuric acid, and the sulphate formed, decomposed by ammonia. M. GIRARDIN states that he has obtained a greater product of morphia by this process than by any other.

On the subject of morphia, we refer our readers to Dr STAPLES's process, given in the last number of this Journal. It is some time since the writer was obligingly furnished by Dr STAPLES with portions of morphia, both pure and impure, as obtained by his process. He has employed the article, by the method of endermic medication, in some ten or fifteen cases, and can bear testimony to the potency of the preparation. The purer sample is shining, and almost perfectly white; the impure, of a nankin colour. There is no marked difference in their operation; both usually procuring sleep, when applied to a blistered surface, in the dose of the eighth of a grain. Sometimes, however, a quarter of a grain is necessary to produce the anodyne effect.—F. B.

69. *Discrimination of the Native Vegetable Alkalies.*—At a meeting of the French Institute, held on the 18th of February last, a memoir was read, on the application of iodine and bromine to the purpose of distinguishing the organic alkalies. These simple bodies, in vapour, are found to develop, in the alkalies referred to, distinctive colours, consisting of various tints of yellow, red, and violet. The different alkalies, merely distinguished by numbers, were sent by M. PELLETIER to the author, who was enabled, by his method, to determine the name of each. The author expects to be able, by the aid of these reagents, to detect the presence of the organic alkalies in various mixtures, including those consisting of alimentary substances.

70. *Formation of Sulphuric Ether.*—M. CHEVREUL made a report to the French Institute, on the 10th of Dec. 1827, on a memoir, having this title, communicated by MM. BOULLAY, Jun. and DUMAS. He sums up their results in the following propositions:

1. The authors have determined the elementary composition of the sweet oil of wine.
2. They have demonstrated, that this substance, by union with hyposulphuric acid, constitutes the sulphovinic acid.
3. They have confirmed by new analyses, the composition of alcohol and ether.

71. *Pyrothonide.*—This is the name given by Dr RANQUE, chief physician of the Hôtel-Dieu at Orleans, to a product obtained by the combustion of hempen, linen, or cotton cloth. As it is coming into notice as a remedy for chilblains, chronic inflammations of the eyes, we give the directions for its preparation:

Take a handful of hempen, linen, or cotton cloth, either old or new. Place it in a shallow basin, and set fire to it in the open air. As the combustion proceeds, prevent the basin from heating too much. When it has ceased, reject the carbonaceous residue, and there will be found a semi-aqueous, semi-oily product, of a reddish and brownish tint, and possessing a penetrating, but not disagreeable odour. Pour upon this substance a glass of cold water, and spread the water by means of a bottle brush, over those parts of the basin where any of the oil may have formed, with a view to its complete solution. In this manner, a liquid is obtained, of a tint more or less deep, according to the quantity of the substance, produced by the combustion and dissolved in the water.

The substance proposed by M. RANQUE would seem to be analogous to, if not identical with, that familiarly denominated oil of linen, and oil of paper.—*Nouv. Bibliothèque Médicale, Jan.* 1828.

72. *Sulphur in Assafœtida.*—M. ZEISE has discovered sulphur in assafœtida. He proves its presence by the following means:—If assafœtida be treated with caustic hydrate of potassa and an acid be afterwards added, an effervescence occurs, and the gas disengaged blackens paper, wet with a solution of acetate of lead. If the drug be dissolved in alcohol, the solution evaporated to dryness, and the dry mass treated with nitromuriatic acid, a liquid will be obtained containing sulphuric acid. Finally, if the volatile oil of assafœtida, in a state of purity, be burnt, a strong smell of sulphurous acid will be perceived.—*Journal des Progrès, Tome VIII.*

73. *Cantharidin.*—M. BRETONNEAU communicated the following facts to the French Institute, at its sitting of the 24th of December last. His researches were undertaken to determine the relative quantity of cantharidin in different kinds of cantharides. He found those to possess the vesicating property in the highest degree, which belong to a species of the genus *mylabre*, to which M. DEJEAN has given the name *variabilis*.

M. BRETONNEAU's method of obtaining cantharidin is the following: Fill a glass tube, sealed at one end, one-third full with coarsely powdered cantharides

Add sulphuric ether, so as to cover them to the height of several lines. The tube, being well corked, is heated to 104° Fahr. Being allowed to cool,—as soon as the temperature falls to 86°, and the evaporation of the ether is longer to be feared, a ball of carded cotton is pressed into the tube, after the manner of a gun wad, and forcibly compressed by means of a metallic rod. In a moment the ether is absorbed, clarified, and evaporated, and leaves a fatty substance, which it had taken up from the cantharides. This substance is a coloured oil, sometimes combined with fat, to which it communicates a peculiar tint. It is to these two substances that the cantharidin is united; and when thus combined, it produces its epispastic effect. When this compound is mixed with a fixed oil, it communicates to the latter its vesicating property in a high degree. A piece of paper which has been made to imbibe an oil thus prepared, forms an excellent blister, which may be accommodated accurately to the shape of any part, however irregular it may be. The vesication thus produced is so exactly circumscribed, that the blister produced corresponds with the sharpest angles, which may be given to the paper employed.

74. *New Preparation of Copaiva.*—On the 26th January last, a communication was made to the Section of Pharmacy of the French Academy, by M. MIALE, on a mode of solidifying this balsam, so as to bring it to a proper consistence to form pills. The method is as follows: Take a pound of the pure balsam, and an ounce of magnesia, strongly calcined. Place the balsam in a plate, and add the magnesia by means of a sieve. Mix and keep the mixture, guarded from the contact of air, for fifteen or twenty days. At the end of this time, the mixture will have acquired a consistence proper for pills, which being made of the weight of eight grains, will contain seven and a half of the balsam.

M. MIALE states, that this preparation possesses the same powers as the balsam in its ordinary state. He also assures us that the employment of his process furnishes a means of determining the purity of the article. If it be sophisticated with castor oil, it acquires the consistence only of a syrup or ointment. The magnesia must be strongly calcined by a prolonged ignition.

Miscellaneous Articles.

New Theory of the Spleen.—Dr J. H. MILLER, professor of the practice of physic in the Washington Medical College, Baltimore, has addressed to the Editors of this Journal a letter, in which he authorizes them to make, on his part, the following statements.

Dr M. has come, by a series of observations and reflections, to conclusions resembling, in some points, those of M. JULES ARTHAUD, noticed in our last number. The mind of Dr M. was directed into the course of thinking which ultimately led to his present opinions, in the years 1808—9, and 10; in the last of which, he was engaged, together with the late Dr DORSEY, then adjunct professor of surgery, and Dr B. KUGHLER, demonstrator of anatomy, in a course of experiments, in part designed as repetitions of those of LE GALLOIS. From that period to the present, he has been occasionally occupied in gradually perfecting his new doctrines, which, in the session of 1827-8, he commenced delivering from his chair in the Washington Medical College. The engagements of a large practice in the country prevented their publication; but he communicated them to his fellow professors, in the year preceding that last named.

In compliance with the request of numerous professional friends, and especially of his class, Dr MILLER is engaged in preparing a work for the press, in which he will not only give an exposition of his principles, but also their application to the science generally. In the meanwhile, an outline of his views may be gathered from the following propositions, which we extract from his letter.

"Life depends on organization, and essentially consists in self-motion and self-reparation or sustentation. The grand moving principle is the nervous fluid or rather fluids. That this or these principles act through the medium of the nerves is not only inferred from analogy, but established by experiments and demonstrated by facts.

"There are three sets or systems of nerves.

"The first comprises the nerves of sensation, emanating from or centring in the cerebrum, the seat of thought or intelligence.

"The second,—those of motion, passing to or from the cerebellum.

"The third,—the ganglionic system or great sympathetic nerve, whose source or centre is the spleen or great secreting gland, analogous to the cerebrum and cerebellum of the two former, and which is the actuating power of all the involuntary motions, circulation, digestion, secretion, &c. &c.

"This last, according to the order of nature, ought to rank first; because it is the first formed, and exists in the inferior animals unprovided with the former. This is manifest from a slight observation of natural history, which abundantly shows that there is no animal without a sympathetic nerve, and that a cerebellum and cerebrum are only appended to the higher orders or vertebral animals.

"The ganglionic system is not supplied with a spleen, until the increased duties of the digestive and assimilative apparatus for the increased demand by the superadded organs of voluntary motion, sensation and thought, render it necessary.

"Previous to the formation of the spleen, the ganglionic nerves, by means of an infinite number of radicles arising from the inner coats of the larger arteries, imbibe the first crude and ready formed fluid from the blood, and transmit it to the various destinations by the general radiating cords. These radicles continue to act in this manner, and are the chief instruments for imbibing the nervous fluid, even after the system acquires ganglia and a spleen. Hence it is that life may be sustained under disease of these organs, or after their removal, although in an obviously imperfect manner.

"The ganglionic system is distinct from and independent of the other nervous systems and centres. It arises neither from the brain nor spinal cord; but more strictly, they are indebted to it for existence, not directly by extension, but indirectly by secretion. Their twigs or branches never unite by anastomosis, however they may touch or inosculate.

It does enter the brain, not as a single cord, but in numerous ramifications, mostly in company with the arteries, to perform its office of secretion, &c. for the brain itself. It frequently meets with branches of the cerebral and spinal nerves, and travels in company with them, but still to perform its own offices.

"If we examine its anatomical structure and distribution, we discover that, far from originating from either cerebrum, cerebellum, or spinal marrow, its proper centre is located in the epigastric region, where we find its chief plexus (the solar) and its larger ganglia (the semilunar) between the crura of the diaphragm, over the spine and in contact with the spleen; from which it obviously arises in a thick coat surrounding the splenic artery, passing off to form the solar plexus, and thence divaricating in all directions, cerebral, lateral and pelvic."

Impediments in Speech.—At a meeting of the French Institute, held on the 10th of March 1828, MM. DUMERIL and MAGENDIE made a favourable report on a memoir by M. MALBOUCHE, relative to the method of an American lady, named Leigh, for curing stammerers.

It is stated that this lady, after having examined all the French and English authors on the causes of stammering without any advantage, undertook herself to observe the most minute circumstances, connected with this infirmity. Having satisfied herself that she had discovered the immediate cause of stammering, she conceived a system of exercises for the organs of speech, by means of which she effected many radical cures. Afterwards a special institution was opened in New-York, in which, since 1825, more than 150 stammerers are said to have been cured.

The time necessary to effect a complete cure varies: it depends much less on the intensity of the malady, than on the moral energy of the individual affected. The longest treatments, however, do not require more than six weeks; while it is not rare for the cure to be effected in a few days, and even in a few hours.

The method in question, upon being introduced into the Low Countries, was attended there with the same success, and obtained rewards from the king, on the report of a commission.

M. MALBOUCHE, authorized to make known this discovery in France, has demonstrated by positive facts, which the committee of the Institute has confirmed, that it is attended by the results announced. Letters from many stammerers, recently cured, have confirmed the good effects of the plan.

The committee, therefore, consider it as their duty, to extend their approbation to the method of Mrs Leigh; and they would have proposed that the Academy should give it publicity, if particular circumstances had not determined M. MALBOUCHE to require that the details of the method should be kept secret.

Table of the Mortality in the Medical Department of the Philadelphia Alms-House.

Dates of Admission.	Women's Medical Wards.		Men's Medical Wards.		Men & Women's Surgical, and Women's Venereal Wards.		Men's Venereal & Eye Wards, Cells, and Obstetrical Wards.	
1827.	No. admitt.	Deaths.	No. admitt.	Deaths.	No. admitt.	Deaths.	No. admitt.	Deaths.
June	62	5	69	13	54	3	59	3
July	76	7	78	8	57	4	57	3
August	70	8	110	14	70	4	65	4
Sept.	49	9	105	20	58	5	56	4
Octob.	58	8	150	3	79	3	66	4
Nov.	107	14	128	14	77	0	63	7
Dec.	61	13	93	17	68	3	52	1
1828.								
Janua.	49	9	96	11	48	2	50	3
Febru.	61	3	60	9	49	1	52	3
March	47	10	71	12	73	3	50	3
April	55	4	46	9	60	3	49	2
May	46	9	76	8	65	1	52	3
Totals	738	99	1082	138	768	32	671	40

RECAPITULATION.

Number of Women treated in Women's Medical Wards . 738
Deaths 99
Percentage 13.4

Number of Men treated in Men's Medical Wards . 1082
Deaths 138
Percentage 12.8

Number treated in Men & Women's Surg. and Women's Ven. Wards 768
Deaths 32
Percentage 4.14

Number treated in Men's Ven. & Eye Wards, Cells, and Obstet. Wards 671
Deaths 40
Percentage 5.96

Medical Patients treated . . . 1820
Deaths . . . 237
Percentage 13

Surgical Patients, &c. treated . . 1439
Deaths 72
Percentage . . . 5

Total treated . . 3259
Deaths . 309
Percentage . 9.4

E. R. CHEW, Senior Student.

Craniology.—There was presented at a meeting of the French Academy of Sciences, held 31st December 1827, a work, which merits, say the French journalists, to fix the attention of the learned world.—The author is a Dr VIMONT of Caen, in Normandy, who, struck with the exact coincidences between the display of certain mental faculties and the development of the corresponding parts of the brain indicated by Gall, determined to institute a series of observations for himself. The result of six years' careful investigation and comparison is a magnificent collection of two thousand heads of the mammiferous animals and birds, in all of which he has found entire confirmation of the often ridiculed doctrine of craniology. He has shown, what many have denied in our own species, the strict relation between the prominences of the brain, the depressions formed by these on the internal surface of the scull, and the corresponding projections externally. This he has demonstrated by means of casts of the brain in wax, and sections of the scull in various directions. In other words, the prominences, or bumps as they are familiarly called, of the surface of the scull without, give the measure of the fulness of the particular portions of the brain within, and between those last and the propensities and habits of each animal thus studied, Dr VIMONT has discovered the most exact conformity.

In addition to a large number of brains moulded in wax from nature, there is, accompanying the work (a volume in quarto), an atlas of eighty plates, in which more than four hundred objects are delineated, with an anatomical accuracy and beauty of drawing hitherto unrivalled.

Circular—Medical Department of the Columbian College.—To complete the organization of the Medical Department of the Columbian College, a Chair, denominated *The Institutes of Medicine and Medical Jurisprudence*, has been established.

Professor RANDALL having been appointed to the newly created Chair, the vacancy occasioned by his resignation of the Professorship of Chemistry has been filled by THOMAS P. JONES, M.D., formerly Professor of Chemistry and Natural Philosophy in William and Mary College, and late of the Franklin Institute. By these arrangements, the scientific advantages of the Students are greatly augmented, without any material increase of expense, the graduation fee being reduced from thirty-five to twenty dollars.

During the last Course of Lectures, the Professors occupied their new Medical College, erected during the past Summer, and the result of the Winter's experience proves that the building is well suited to the purposes for which it was designed.

It is large and commodious, consisting of three elevated stories, with a roof peculiarly constructed for the admission of light into all the apartments appropriated to anatomical purposes.

On the ground floor is the Lecture Room, Laboratory, &c. of the Professor of Chemistry.

The second story contains the rooms, public and private, of the Professors of the Theory and Practice of Medicine and of Materia Medica, and of the Institutes of Medicine and Medical Jurisprudence.

In the third is the Anatomical Theatre, together with rooms occupied by the Professors of Anatomy, Surgery, and Obstetrics.

The theatre is designed from the most approved plans, and is conveniently connected with the rooms situated in the superior part of the building, which are intended for the purposes of Practical Anatomy. In relation to this particular department of the school, the professors have pleasure in saying, that care has been taken to provide space, light, and security, together with every other specific convenience that may afford to the Student facility in prosecuting to advantage this necessary part of his collegiate studies. Rooms have, also, been set apart for a Medical Library and a Museum of Anatomical Preparations.

Since the commencement of the last Session, the Professors have laid the foundation of a Library. Already medical works to a considerable amount have been collected, and provision has been made for its regular and speedy increase.

The Fifth Session of the Institution will commence on the first Monday in November next, and continue to the last of February. During this period, Lectures will be delivered daily, and full courses will be given on the various branches of Medicine, by

THOMAS SEWALL, M.D., Professor of Anatomy and Physiology.
JAMES M. STAUGHTON, M.D., Professor of Surgery.
THOMAS HENDERSON, M.D., Professor of the Theory and Practice of Medicine.
N. W. WORTHINGTON, M.D., Professor of Materia Medica.
FREDERICK MAY, M.D., Professor of Obstetrics.
RICHARD RANDALL, M.D., Professor of the Institutes of Medicine and Medical Jurisprudence.
THOMAS P. JONES, M.D., Professor of Chemistry.

The Ticket of each Professor is fifteen dollars; and all persons who have attended two full Courses, in this School, are entitled to attend succeeding Courses free of expense.

The requisites for graduation are similar to those required in the most respectable Institutions in the country. The candidate shall have studied three years under the direction of some regular physician. He shall have attended each Professor two full Courses, or he shall have attended one full Course in this School, and one in some other respectable Medical Institution. He shall have entered his name with the Dean as a candidate for graduation, and delivered to him an inaugural dissertation on some medical subject, thirty days before the close of the session.

The degrees are conferred under the authority of the Charter of the Columbian College, incorporated by the Congress of the United States.

R. RANDALL, M.D. Dean.

Writ for the Medical Convention of 1830.—Whereas the Convention that was held at the City of Washington, in the month of January 1820, for forming a Pharmacopoeia for our United States of America, did resolve that the President of that Convention should, on the 1st day of January 1828, issue Writs of Election to the several incorporated State Medical Societies, in the northern, middle, southern and western districts of the Nation, requiring them to ballot for three Delegates to a General Convention, to be held at Washington, on the 1st day of January 1830, for the purpose of revising the American Pharmacopoeia; and whereas the several Institutions, as aforesaid, are, by the same authority, requested to forward to the President, on or before the first day of April 1829, the names of the three persons so chosen; with sundry other provisions contained in the historical introduction to the work, to which the reader is referred.

Now therefore, I, SAMUEL L. MITCHILL, by virtue of the power vested in me by the Convention of 1820, do hereby give notice to all the incorporated Medical Societies, Colleges of Physicians and Surgeons, Medical Schools, and Faculties of Universities and Colleges, and all other authorized Bodies, that they choose proper persons to represent them in the General Convention to be held in January 1830, for revising the Pharmacopoeia.

Given under my Hand, this first day of January, 1828, at the City of New-York.

SAMUEL L. MITCHILL, President.

Bodies for Dissection.—"HOUSE OF COMMONS, *Monday, March* 24, 1828. Mr Dugdale presented the following petition from the Physicians and Surgeons of Birmingham, complaining of the inconvenience experienced by numbers of their profession from the want of bodies for dissection, and calling upon the House to remove the impediments which were at present thrown in the way of the cultivation of anatomical science.

"*To the Right Honourable the Commons, &c.*

"We, the undersigned physicians and surgeons of the town of Birmingham, re-

spectfully implore the attention of your right honourable House to the urgent necessity of adopting some measures to remove the impediments to the cultivation of the science of Anatomy.

"Unfortunately deprived of legislative authority, exhumation is, at present, the only method by which bodies can be procured for anatomical purposes, a method painful to the feelings of the public, and opposed by the laws of this realm.

"In various parts of the continent of Europe the prosecution of the science of Anatomy is protected by their respective governments, and every facility afforded for its liberal and extended cultivation; hence, the youth of Great Britain, designed for the medical profession, are compelled to proceed to foreign countries in pursuit of that information which is denied to them here.

"As the practical surgeon is formed only by the laborious study of Anatomy and actual Dissection, your petitioners presume not to dwell upon the advantages to be derived by the public service and society at large, by attention to their prayer.

"Your petitioners most earnestly solicit your right honourable House to take this important subject into its serious consideration, and adopt such measures as in its wisdom may be deemed fit.

"And your petitioners will ever pray.

"Sir R. Fergusson thought that few, if any, such petitions had ever before been presented to that House; but he could not help thinking that the subject now called to their attention, perhaps for the first time, deserved the most serious consideration of the House. It was a matter of the most vital importance, and the difficulty of procuring subjects was at present so great, that he feared, if it were suffered to continue, the teaching of anatomy must stop, and the schools would be deserted for the want of means to offer instruction to the pupils.

"Sir J. Yorke said, he had presented some petitions of this kind in the course of last year, and he was glad that the attention of the House was now recalled to the subject. He wished for a declaratory law, the object of which should be, to let the public know that any one *in articulo mortis* was at liberty to sell his body for anatomical purposes, and to allow executors, administrators, and assigns, to give over the bodies of such persons to the purchasers. He was certain that if such a law was passed, there would be bodies in abundance; for there were few paupers who would not be glad to leave ten guineas to their widows; and the practice, thus introduced, would have this particular advantage about it, that those who went out of the world with any particular disease would be known to the medical profession, who would purchase their bodies, and thus be better enabled to ascertain the nature of that disease, and its effects upon the human frame, than they could possibly hope to do when, as at present, they were generally supplied with healthy subjects, that were only good for the purpose of teaching the younger pupils the common processes of dissection. He thought the House should state the law to be what he had mentioned; for now he believed it was generally considered that such a disposition of the body by the executor, although under the directions which the testator had given, was not authorised by law.

"Mr Warburton said, that in a short time he should move for a Committee to inquire into the subject which the petition had brought under the notice of the House. He had determined on doing so, in consequence of the particular request of some of the first surgeons in the metropolis. In a subsequent part of the evening, the Hon. Member fixed his notice of motion on this subject for Thursday next.

"Mr P. Thompson thought, that among the alterations of the criminal law, the House might introduce one which would materially assist in destroying the prejudice now commonly entertained against anatomical dissection. One of the concomitants of the severest penalty of the law was, in some cases, the handing over the body of the malefactor for dissection, and that circumstance tended to create a strong feeling of prejudice, which would probably cease to exist when that part of the law was altered. There was no such feeling in France, where bodies might be procured at ten francs each; in consequence of which there was

no want of subjects for the schools, and the science of anatomy was taught under much greater advantages than in this country.

"The petition was brought up, read, and ordered to be printed."

On the 21st of April 1828, the London Medical Society held the following proceedings, relating to the same subject.

"Dr Clutterbuck pointed out, in a forcible manner, the disadvantages and impediments which at present exist in the cultivation of the science of anatomy; he observed, that at the time he was a pupil, subjects could be procured at the price of two guineas; whilst, at the present time, twenty guineas, or more, are paid, and the bodies are obtained with the greatest difficulty. The consequence of this, Dr Clutterbuck remarked, is, that students, with limited means, omit the study of anatomy, whilst others go abroad, where subjects are readily procured, and at a cheap rate. The worthy Doctor concluded by moving, that a petition which had been drawn up by the council, and intended to be presented to the Commons, should be read.

"The Registrar then read the petition, and a lengthened debate arose upon it; Mr Kingdon, Mr Cook (late of Exeter), and other members, objecting to the petition on the ground of its referring almost exclusively to the hardships experienced by *teachers*, in the want of subjects for dissection. It was at length moved by Mr Lambert, that a part of the petition to the above effect should be omitted, and this having been agreed to, together with some verbal amendments, the following petition was ultimately adopted.

"*To the Honourable the Commons of Great Britain and Ireland in Parliament assembled.*

"The humble Petition of the undersigned, the President, Council, and Fellows, of the Medical Society of London, established in the year 1773.

"Showeth,—That the perfection of medical and surgical science is founded upon an intimate and minute acquaintance with the structure and functions of the human body.

"That the requisite knowledge of anatomy and physiology can only be obtained by the frequent inspection and constant study of the dead human subject.

"That an adequate supply of dead subjects is indispensably necessary to enable the teachers of medical and surgical science, to explain to students the complex structure and varied functions of the animal frame in health, and the innumerable alterations effected in it by different states of disease.

"That the physicians and surgeons of this kingdom are altogether prevented from obtaining such adequate supply by the existing laws, which prohibit, under severe penalties, both pecuniary and personal, the appropriation of dead bodies generally, to anatomical purposes.

"That the facility with which subjects for anatomical purposes can be procured in all other countries compared with this, necessarily compels great numbers of medical and surgical students to go abroad for the purpose of prosecuting their professional studies.

"Your petitioners, therefore, humbly entreat your honourable house to take the matter of their petition into your gracious consideration, and to afford them such relief, as to your honourable house shall seem meet. And, &c.

"It was unanimously resolved, that the petition should be placed in the hands of Mr Warburton, and that it should remain for signature, at the rooms of the Society, until one o'clock of the following day; the time being thus limited, in consequence of the motion for a committee in the House of Commons, taking place on Tuesday night.

"On the motion of Mr Kingdon, a committee was appointed for the purpose of drawing up a petition, to be presented to the House of Lords; and it appeared to be the general wish of the Society, that this petition should be more comprehensive in its nature, than the one agreed upon for the Commons.

"Mr Alcock, on this point, very well remarked, that the leading feature of the petitions on this subject should be public benefit, and that the hardships and grievances of individuals, or classes of individuals, should not be dwelt upon.

"At the conclusion of the evening, a kind of conversational debate ensued, on the best means of supplying the schools of anatomy with subjects.

"Mr S. Wray stated, that it was his conviction, Parliament would give no remedy, and that medical men should themselves set an example, by giving up their own bodies for the purposes of dissection, and thus Mr Wray argued, the way would be paved, as it were, towards diminishing the prejudices of the public.

"Mr Lambert met these opinions by observing, that the notion of medical men giving up their own bodies, which had been trumpeted forth through many of the public papers, arose from a mistaken and narrow view of the subject. It was admitted on all sides, that no injury is done to the person dissected; the only injury committed, being upon the feelings of the relatives, or friends, of the deceased; hence the proposition was self-evident, that if the person submitted to dissection, had no friends or relatives, then no injury was sustained. He, Mr Lambert, was perfectly willing that his body after death should be dissected; but he could not forget, that there were those near and dear to him, whose feelings would be outraged, and this injury he had no right to inflict. Mr Lambert further remarked, that the annual amount of unclaimed bodies in the metropolis, as could readily be proved, would amply suffice for the supply of the anatomical schools; this appeared to him the only means that could possibly be adopted; to talk of diminishing the prejudices of surviving relatives, was, in his estimation, idle.

"Mr Kingdon concurred with Mr Lambert, with respect to dissecting unclaimed bodies; but, at the same time, he thought the public feeling might be well consulted, by making it compulsory, as in France, to give christian burial to the remains of the bodies, after the purposes of dissection had been served."—*Lancet, March* 29, *and April* 26, 1828.

TRANSLATION OF HUFELAND ON SCROFULA.

In press for the Trade by James Kay, Jun., and will shortly be published,

A Treatise on Scrofula. By C. G. HUFELAND, Physician to the King of Prussia, and Counsellor of State.—Translated from the French of BOUSQUET, by CH. D. MEIGS, M.D. Member of the American Philosophical Society, &c.

Erratum.—The following error of oversight may be worthy the trouble of correction. In page 87, line 32, dele "[Erythronium dens canis?]" The plant alluded to is a species of Triticum, most probably *Triticum repens.*